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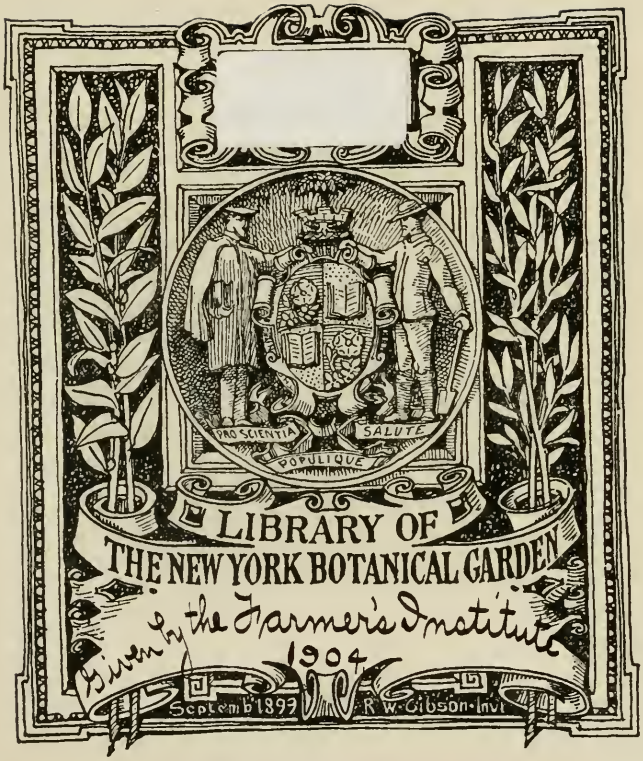
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INSTITUTE BULLETIN NO. 5 SEPTEMBER 1899

MICHIGAN

STATE

FARMERS' INSTITUTES

WINTER OF 1898-9

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KENYON L. BUTTERFIELD. - - AGRICULTURAL COLLEGE, MICHIGAN.

MAY 2 1904

LETTER OF TRANSMITTAL.

To the State Board of Agriculture:

Gentlemen—I herewith transmit a report of the Farmers' Institute work carried on under the direction of your honorable board during the fiscal year ending at this date.

Yours respectfully,
KENYON L. BUTTERFIELD,
Superintendent.

AGRICULTURAL COLLEGE, *Mich., June 30, 1899.*

INTRODUCTORY.

The plan of this report has been changed somewhat from that of former ones in that the statistical matter has been placed last. Facts and figures regarding details of the work have been put into the smallest possible compass. We invite special attention to that part of the report which shows our plans of work and the results obtained.

The general success of the work during the past season has been marked. The severe cold interfered most seriously with attendance in twelve or fifteen counties where we usually have largely attended Institutes. This partially accounts for the fact that the total attendance at Institutes this last winter was not quite so large as the previous one The membership list is considerably larger.

The law and rules governing Farmers' Institutes for the past two years will be found on page 10 of the report for 1897-8.

Besides the State Round-up, there were held during the year 68 Two-day County Institutes (including special fruit and dairy Institutes) and 115 One-day Institutes.

FOURTH ANNUAL

MICHIGAN ROUND-UP FARMERS' INSTITUTE,

HELD AT

PONTIAC, OAKLAND COUNTY,

MARCH 1, 2 AND 3, 1899,

UNDER THE JOINT AUSPICES OF THE

OAKLAND COUNTY FARMERS' INSTITUTE SOCIETY AND THE STATE BOARD OF AGRICULTURE.

PROGRAM.

WEDNESDAY, MARCH 1.

FORENOON.

IN THE LYCEUM.

8:15 Conference of officers of County Institute Societies.

IN THE OPERA HOUSE

9:45 Introductory.

Rolland Morrill, presiding.

10:00 "Sugar Beets:"
(1) "From the farmer's standpoint," J. Y. Clark, Oakland Co.
(2) "From the factory standpoint," N. B. Bradley, Bay City.
(3) "A word of encouragement and a word of warning," Prof. C. D. Smith, Agricultural College.
Discussion after each address.

AFTERNOON.

IN THE OPERA HOUSE.

E. A. Croman, presiding.

1:00 Question Box.
1:15 "The importance of mixed farming," Hon. H. H. Hinds, Montcalm Co.
Discussion, led by Hon. Peter Voorheis, Oakland Co.

2:15 "Improvement of the soil the first factor in greater agricultural prosperity," Hon. Geo. T. Powell, Ghent, N. Y.
Discussion, led by I. N. Cowdrey, Gratiot Co.
3:15 "Good Roads":
"Road Improvement," F. F. Rogers, Port Huron.
"An experience with the county road system" A. E. Palmer, Kalkaska Co.
Discussion on good roads and the county road system.

EVENING.

IN THE OPERA HOUSE.

J. W. Hutchins, presiding.

7:30 "Possibilities of farm life," J. T. Daniells, Clinton Co., Ex-President State Association of Farmers' Clubs.
"Rural embellishment," W. W. Tracy, Detroit.
"Farm organizations," Hon. Thos. Mars, Berrien Co., Past Master Michigan State Grange.
Discussion after each address if desired.
Music for the evening will be furnished by Prof. Barnard Thomas, Miss Agnes McCotter, and Callow's Orchestra.

THURSDAY, MARCH 2.

FORENOON.

IN THE LYCEUM.

8:15 Conference of officers of County Institute Societies.

IN THE OPERA HOUSE.

A. E. Palmer, presiding.

9:45 Question Box.
10:00 "The Dairy":
"How to choose a good dairy Cow," Prof. C. D. Smith, Agricultural College.
"The feeding and care of a small dairy herd," Colon C. Lillie, Ottawa Co.
"Gilt-edged butter at home," G. H. True, Agricultural College.
"Marketing the product of the home dairy," Mrs. Ella E. Rockwood, Genesee Co.
"Advantages of the creamery," E. A. Croman, Jackson Co.
Five minute discussion after each talk.
11:30 General discussion of dairy topics, led by George Jennings, of Oakland Co.

AFTERNOON.

IN THE OPERA HOUSE.

L. J. Post, presiding.

1:00 Question Box.
1:15 "Demands of the present times in the handling of orchards," Hon. Geo. T. Powell.
Discussion, led by Prof. L. R. Taft, Agricultural College.
2:15 "Forestry":
"Conditions and prospects in Michigan," F. E. Skeels, Lansing.
"Desirable forestry legislation," I. H. Butterfield, Agricultural College.
Discussion on Forestry.
3:15 "The apple situation in Michigan and its remedy," Roland Morrill, Berrien Co.
Discussion, led by A. P. Gray, Grand Traverse Co., and J. N. Stearns, Kalamazoo Co.

EVENING.

IN THE OPERA HOUSE.

C. B. Charles, presiding.

7:30 "Some unsolved problems," Hon. J. E. Hammond, Superintendent of Public Instruction, Lansing.
Discussion, led by President J. L. Snyder, Agricultural College.
Music, "The Chimes," by J. C. Macey. Ladies' Quartette.
"How to introduce the study of agriculture most practically into our public schools," Hon. Geo. T. Powell.
Discussion, led by A. G. Randall, Calhoun Co.
"The mother and the school," Mrs. Mary A. Mayo, Calhoun Co.
Music, "Legends," by Mohring. Ladies' Quartette.

FRIDAY, MARCH 3.

FORENOON.

IN THE LYCEUM

8:15 Conference of officers of County Institute Societies.

IN THE OPERA HOUSE.

J. G. Noble, presiding.

9:45 Question Box.
10:00 "Cattle feeding in Michigan, its prospects and its practice," Jason Woodman, Van Buren Co.
Discussion, led by Hon. William Ball, Livingston Co., and Jothan Allen, Gratiot County.
10:50 "The farmers' defensive movements," A. B. Cook, Shiawassee Co., Secretary of the State Association of Farmers' Clubs.
Discussion, led by C. B. Charles, VanBuren Co.
11:30 Business meeting of the Oakland County Farmers' Institute Society.

AFTERNOON.

IN THE OPERA HOUSE.

Jason Woodman, presiding.

1:00 Question Box.
1:15 "Wool," Prof. H. W. Mumford, Agricultural College.
Discussion, led by Robert Gibbons, Detroit.
2:15 "Economical sheep feeding," A. M. Welch, Ionia Co.
Discussion, led by A. B. Cook.
3:15 "The prevention of animal diseases by proper care," Dr. Geo. A. Waterman, Agricultural College.
Discussion.

EVENING.

IN THE OPERA HOUSE.

Hon. C. J. Monroe, presiding.

7:00 Opening concert, Orchard Lake Military Academy Orchestra.
7:30 "The influence of the science movement upon farm life," Dr. W. H. Jordan, Director New York Agricultural Experiment Station, Geneva, N. Y.
Music, "The Bloom Is on the Rye," by Bishop. Ladies' Quartette.
"Farming in Oriental Countries," President J. B. Angell, University of Michigan, Ann Arbor.
Music, "Last Good Night," by W. Rees. Ladies' Quartette.

THE WOMEN'S SECTION.

HELD IN THE LYCEUM ON THE AFTERNOONS OF

WEDNESDAY, THURSDAY AND FRIDAY, MARCH 1, 2 AND 3.

CHAIRMAN AND CONDUCTOR, MRS. MARY A. MAYO, BATTLE CREEK.

WEDNESDAY AFTERNOON, MARCH 1.

1:15 Greeting, Mrs. Mary A. Mayo.
1:30 "Chemistry of Cooking and Cleaning," Miss Ellen R. Rushmore, Agricultural College.
Discussion.
2:30 "The mother's greatest need," Mrs. Irma T. Jones, Lansing.
Discussion, led by Mrs. Maud B. Shattuck, Oakland Co.
Question Box.
Music for session by Miss Agnes McCotter.

THURSDAY AFTERNOON, MARCH 2.

1:15 "The art of living," Mrs. Alex Custard. Mendon.
Discussion.
2:30 "The true helpmate," Mrs. Ella E. Rockwood, Flint.
Discussion, led by Mrs. J. H. Holman, Rochester.
Question Box.
Music for the session by Miss Nellie Snook, Rochester, and Mrs. Grace Grayley, Pontiac.

FRIDAY AFTERNOON, MARCH 3.

1:15 "The value of training," Miss Maud R. Keller, Agricultural College.
Discussion, led by Miss Jessie H. Smith, Pontiac.
2:10 "Town and country clubs for women," Miss Katharine M. Inglis, Alma College.
Discussion.
3:00 "Consecrated parentage," Mrs. Belle M. Perry, Charlotte.
Music for the session by Mrs. Wilbur Fletcher Sheridan.

REPORT OF THE STATE ROUND-UP.

As has been our habit for several years, the set addresses given at the Round-up appear in this report in the form of abstracts made by the speakers themselves. Reports of discussions and of the question box have been furnished for this report by Prof. C. D. Smith. In this way we have succeeded in compressing a complete record of the meeting into the smallest possible space.

WEDNESDAY FORENOON.

INTRODUCTORY.

The Institute was called to order by J. G. Noble of Orion, President of the Oakland County Farmers' Institute Society, who, in introducing Superintendent K. L. Butterfield, said in substance: The Institute Society of Oakland county did so well last year that the Round-up institute has come to us as a reward for our well doing. It has required no little work to bring about these results; work on the part of the officers and members of the association, supplemented by the help of the business men of the town and by the newspapers. Five one-day meetings were held in the county last year, and one two-day county Round-up Institute. We ascribe our success to a great degree to the wise generalship of the Superintendent of Institutes, who, like a general commanding an army, has had a comprehensive grasp of the whole situation in this county and in the State at large.

Superintendent Butterfield announced that several places in the State had applied for the honor of entertaining the Round-up Institute, but that it had come to Oakland county in 1899 largely because of the good work done in that county in the previous campaign.

This Round-up Institute is the one in which the work of the season culminates and is summarized. Here both workers and the local community get enthusiasm for the year to come. The excellent record made during the past year by the Oakland County Institute Society is the principal reason for the selection of Pontiac as the place of meeting of the culminating Institute this year.

Roland Morrill, Benton Harbor, presided during the session.

Mr. Morrill called attention to the peculiar situation of the farmers in the matter of sugar beets. The legislature has given a bounty to the

manufacturers of beet sugar on condition that the farmer receive a fixed price for beets of a certain grade. The State moreover assures the farmer against fraud in weighing and testing by appointing at each factory a weighmaster and analyst, officers to stand between the factory and the farmer to insure absolute justice. There is no question as to the benefits to the State from the introduction of this new industry, this further diversification of crops, but it is to be hoped that farmers will not rush inconsiderately into the business. The questions relating to sugar beets will at this time be discussed from three standpoints; first, that of the farmer; second, that of the manufacturer; and third, that of an unbiased and unprejudiced but observant and interested experimenter.

SUGAR BEETS—FROM THE FARMER'S STANDPOINT.

J. Y. CLARK, ORION, OAKLAND COUNTY.

It was my good fortune the past season to have charge of an experimental acre of sugar beets, raised under the supervision of the Michigan Experiment Station, with the especial object in view of determining the exact cost of production.

The plot selected, which had received no fertilizer since 1891, was a June grass sod, plowed for potatoes in the spring of 1897, plowed and subsoiled to a depth of from 15 to 18 inches in 1898 for the beets. The soil, both surface and sub-soil, varied from sandy loam to heavy red clay. May 19th, after thorough tillage, the acre was sown with improved Klienwanzlebener sugar beet seed furnished by the Experiment Station. The beets received frequent and thorough cultivation and grew thriftily. At the harvest two-thirds of the plot yielded at the rate of 16.58 tons per acre with a percentage of sugar of 17.81, co-efficient of purity 84.8. The remainder of the acre, owing to a partial failure of the seed, was resown three weeks later and gave a much smaller yield. Had the stand been uniform the account would have stood as follows:

EXPENSES.		HOURS.
Man and team—plowing and subsoiling		12
Man and team—preparing		7
Man—sowing	6	
Man—cultivating with wheel hoe	15	
Man—thinning by hand	70	
Man and horse—cultivating (4 times)		20
Man and team—harvesting		16
Man—harvesting	64	
Total	155	55

155 hours—man—at 10 cts. per hour	$15 50
55 hours—man and team—at 25 cts. per hour	13 75
Total cost when secured in the pit	$29 25

CONTRARY, VALUE AT FACTORY.

16.58 tons of 17.81 sugar percentage at $5.45 per ton	$90 36
Apparent profit, from which seed, freight, hauling and dockage must be deducted	61 11

DATES.

Sowing—May 19.
Hand thinning—the week following June 20.
Cultivations—June 9, June 20, June 29, and July 9.
Harvesting—the week following October 25.

From the standpoint of the farmer, the prospects of the beet industry divide themselves into two classes, pleasing and displeasing.

ADVANTAGES OF SUGAR BEET CULTURE.

Among the former may be mentioned the strong probability that Michigan will be the center of the beet sugar industry in the United States. The so-called sugar beet zone follows a very irregular line drawn across the entire continent where the mean temperature from June to September is from 69 to 71 degrees. A great proportion of this vast territory is debarred, by reason of insufficient or irregular rainfall, impure water, scorching winds or alkali soils, from at present profitably raising sugar beets. The eyes of experts are directed toward Michigan and central New York, with an annual rainfall of from 30 to 40 inches, fertile soils, moist growing springs, seasonable showers, and dry sunshiny autumns, as localities especially suited to this industry.

Its establishment means the welcome addition of another and a profitable crop to our present rotation. The grower is assured in advance of a fixed price for his product, and while the expense of raising is relatively large, he may figure against it the value of his own labor and still leave a handsome profit. The apparent profit in the tabulated statement given above, while large, is not unusual.

In this land of insect and fungous pests, the beet has almost entirely escaped their ravages, while its successful cultivation, accompanied by sub-soiling as it must largely be, will have the salutary effect of requiring the most thorough and intensive farming. Pulverization of the soil, breaking up of "hard pans" and "plow pans," and the frequent turning under of clover and other fertilizers, will benefit not only the beet, but all following crops, adding to and making available the plant-foods and rendering less disastrous our drouths by increasing the water-holding capacity and power of capillary attraction from beneath.

In addition, a great impetus will doubtless be given to stock raising, feeding, and dairying in Michigan. Western cattle men report better results with pulp from the beet factories and hay, than with hay accompanied by a grain ration. From 30 to 50 pounds are consumed by each animal daily (with free access much more), and the fattening period is said to be shortened from four to six weeks. In the experience of the speaker nothing can exceed the avidity with which beets, both the fresh tops and the roots, are eaten by cattle, sheep and hogs. Doubtless it would pay richly to grow high grade beets for this purpose only. While very palatable to all, horses possibly excepted, being rich in the carbohydrates they are also very fattening. They contain from two to three times the actual nutriment found in turnips and bagas. In protein (blood and muscle producing material), pound for pound, they are equal to good unhusked cornfodder; in the carbohydrates, or fat forming constituents, they are nearly equal to it, far exceeding in both respects turnips, mangel wurzels and rutabagas. The nutritive ratio accepted as proper for milch cows is 1 to 6.9; that of sugar beets is wider, 1 to 9.6, showing again their tendency to produce fat.

SOME OF THE OBSTACLES.

Up to this point the Michigan farmer has every reason for self congratulation on the advent of this promising infant industry; but he is foolish in the extreme if he does not study and prepare for the difficulties and unusual requirements following in its train. First comes the great amount of hand labor required. Says the Special Report on the sugar beet industry, issued by the United States Department of Agriculture, "It requires all the fortitude of a community to meet the first shock, when the revelation of the amount of labor to be performed in raising the beets first dawns upon them." The "bunching" can be rapidly done with a hoe, and then must follow from 60 to 80 hours of the most tedious hand work to thin an acre. This work can be imperfectly performed or postponed only at great money loss to the grower in decreased percentage of sugar and increased expense in thinning, the season for which lasts but about two weeks. Thereafter the beet roots rapidly twine about each other and greatly hinder separation. As the extreme limit, allowing that one man can thin two acres, at a season, June 20 to July 1st, if there is scarcity of laborers in a community what will be that scarcity when it adds from 3,000 to 5,000 acres of sugar beets to its crop rotation. Obviously contracts should be for small acreages, thinly scattered, or that failing, large importation of laborers be made during this critical period. Harvesting also requires about an equal amount of hand labor.

One of the most irksome tasks imposed is that of sub-soiling, yet it doubtless is one of the most necessary ones upon the average Michigan farms. They are unlike the deep friable soils of the west. Generally speaking, at a depth of from 6 to 10 inches we encounter either a stiff clay sub-soil, a hard pan, or "plow pan," which must be broken to allow the deep penetration of the long tap root, and insure the complete covering of the body of the beet with earth. Otherwise there will result a prongy, mis-shapen, bifurcated mass of roots, protruding high above the surface and low in sugar content. It pays many per cent to sub-soil, opening up as it does a wealth of water, potash, phosphoric acid and nitrogen.

SOIL EXHAUSTION.

As bearing on the question of soil exhaustion, the following table will give an idea of the amount of plant food removed by 1,000 pounds of beets and beet-leaves as compared with the same constituents added to the land by the application of an equal weight of well-preserved barn yard manure:

	1000 lbs. of beets and beet leaves.				1000 lbs. of barn-yard manure.	Value.
	Roots lbs.	Leaves lbs.	Total lbs.	Value.		
Potash	3.3	6.5	9.8	$0.49	5 75 lbs	$0.29
Acid phosphoric	.8	1.3	2.1	.11	3. "	.15
Nitrogen	1.6	3.9	5.5	.77	5.75 "	.81
Total value				$1.37		$1.25

In making the above computation the plant foods per pound have been reckoned at the ordinary prices paid when purchasing commercial fertilizers, namely 5 cents each for potash and phosphoric acid and 14 cents per pound for nitrogen. A ton of beets and their leaves, it will be noted, has a plant-food value of $2.74, and a ton of barnyard manure, $2.50. The removal of 16 tons of roots and leaves from an acre is equivalent to removing the main manurial constituents found in nearly 18 tons, or a very heavy coat, of the best barnyard manure. Nothing further should be required to teach us that sugar beets are an exhaustive crop. As shown in the table, approximately two-thirds of the manurial elements reside in the leaves and tops, therefore they should be left scattered evenly over the surface as a partial restoration of fertility. The longest intervals possible in a rotation should intervene between beet crops on the same land, accompanied by frequent applications of fertilizers, stable or commercial, and clover.

THE SEED.

To secure a large tonnage and a high percentage of sugar requires an even stand, of a medium average weight, generally not to exceed 1½ to 2½ pounds. These results cannot be obtained unless the beets are in close rows, and are close in the row. Hence 8 inch spaces are advised and from 18 to 24 inch rows. The thick seeding and attendant expense entailed, under present methods, must be accepted by the farmer as a necessary evil, which, it is to be hoped, proper tools will soon remove. When rows are 22 inches apart

15 lbs. of beet seed per acre means 1 seed every 1.2 inches, and

18 lbs. of beet seed per acre means 1 seed every .99 of an inch.

In the former instance nearly 7 seeds, and in the latter more than 8 seeds are scattered through a space where one living plant is needed. Is it too much to hope that, with spacing drills and good germinating seed, 3 or 4 seeds placed in a bunch where wanted, will do the work of producing a single strong plant, in place of the 8 or 9 seeds now sown—mostly where not wanted?

It is estimated that farmers tributary to a beet factory are compelled to expend annually for seed from $6,000 to $12,000. It would seem that this large sum, by the use of suitable implements, would admit of material reduction.

The somber side of this question has been thus presented, not to withhold from any the grasp of a golden opportunity, but rather to assist him to that end by casting a ray of light upon the obstacles in his pathway. That they may be overcome the past has amply demonstrated. It is safe to predict that this specially favored State will become the theatre of great beet-sugar making developments in the immediate future.

DISCUSSION.

Q. What is the value of sugar beets for feed?

J. Y. Clark: They have a high value for feeding dairy cows or other stock, for which they are more valuable than mangels, as they contain more dry matter per hundred weight and more sugar. They serve a good purpose in keeping the bowels in right condition when fed in connection with a ration otherwise made up of hay and grain.

Q. Is not the cost of thinning greatly reduced by the skillful use of a hoe?

N. B. Bradley, Bay City: Yes. All our beets about Bay City are first "bunched" with a hoe and then each bunch thinned to a single beet by hand.

Q. Does it not cost more in proportion to grow a single acre than a larger area?

N. B. Bradley: Certainly; but the government experts report the cost for single acres to be less than $40.00.

Q. Is the matter of help so important as to prevent beet growing away from big cities?

N. B. Bradley: The help must be secured in advance. Just let it be known that a larger demand than usual will be made for help in a given locality, and the unemployed will find their way there. I do not think there will be serious trouble on that score; but, of course, beet growers must exercise business foresight and secure help in advance of the need.

Q. Are the tops of the root and the leaves of value for feed?

N. B. Bradley: Yes, of great value for feeding, but they should be left on the ground to keep up the fertility of the soil, as a very large share of the total mineral content of the beet is in the leaves and very top of the root.

Q. Is not six or seven pounds of beet seed enough for an acre?

N. B. Bradley: Yes, if properly spaced by some special tool. At present, however, we know of no safe way of dispensing with the apparent necessity of sowing twelve to fifteen pounds per acre with a garden drill or drill made for the purpose.

At this point Steward E. C. Smith, of the Asylum for the Insane, extended a cordial invitation to delegates to the Institute to visit the asylum at anytime during their stay in Pontiac.

SUGAR BEETS—FROM THE FACTORY STANDPOINT.

N. B. BRADLEY, BAY CITY.

To make profitable the raising of sugar beets a market for them must be had. This can only be secured by building beet sugar factories. The annual consumption of sugar in this country I estimate to be seventy pounds per capita of the population. This would make Michigan's consumption 140,000,000 pounds, costing the people of the State about $7,000,000. This large sum of money is paid out by our people for an article that we must have, every year, and the money for it goes out of the State, and no part of it returns. We consume the sugar and that value is lost to the State as much as though consumed by fire or other element.

The legislature in 1897 acted wisely in passing a bounty law for sugar made within the State, and as a result thereof, one factory has been built. Five or six more factories are now in process of construction, indicating that in 1899 some portion of the sugar consumed will be produced at home.

Michigan requires the product of twenty factories of medium capacity. To build these it would require an investment of about $8,000,000; to stock them with beets a yearly product of 800,000 tons would be required, for which an outlay of $3,200,000 to the farmers would be made, and a further sum of $1,600,000 to work them up. These, with other items of cost, would distribute annually to the people more than $5,500,000, instead of sending this money, together with the earnings of the factories, away. Our own people would be profited by it.

In addition to the $8,000,000 expended in building the factories, a large part of the annual cost of the crop would be invested in permanent property, the stimulating influence of which to all branches of industry would cause an influx of population and of wealth; the latter for investment

that would give to Michigan a prosperity never before witnessed. This would add to the valuation of taxable property so that the State would in a few years receive back into its treasury, in taxes, four fold for the money paid out as bounty in aid of this young but important industry.

THE ONE FACTORY AT BAY CITY.

has, during its first campaign, just closed, worked up between 32,000 and 33,000 tons of beets. For these it has paid out to the farmers about $143,000; for per diem labor say $36,000; for materials necessary in operating, something over $20,000; for salaries and other expenses estimated at $30,000 or more. The result of these expenditures during the one year of its operation has had a marked effect upon the various industries in its vicinity and there is a general acknowledgment of increased business, increased circulation of money, and improved conditions financially. If such a change has been wrought by one year's operation of the one factory, what must be the effect upon the State should twenty factories distributed throughout the State be put to work?

The pulp from the beets after the juice has been pressed out is a valuable commodity as food for stock. This pulp mixed with dry fodder, such as corn-stalks, poor quality of hay or of straw cut up, makes a valuable food for cattle that are to be wintered, and when mixed with ground feed, is very valuable for fattening, the albumen of the beet being cooked, becomes nourishing and the acids give rapid digestion, so that all of the nourishment in the coarse fodder for cattle is made available and in case of fattening for beef, it puts on the fat rapidly.

POSSIBILITIES.

Hon. Secretary Wilson in his recent address in Detroit, speaking of Michigan having been a great lumber state, said that "If the farmers and business men of this State will turn their attention to making sugar, and dairy products from the beets, the annual income * * * would be greater than the annual receipts from lumber;" "The pulp of the sugar beet will pay for the growing;" "If the farmer will take his load of beets to the factory and bring home a load of pulp for the dairy cow, the money he receives for the sugar (beets) will be clear profit." A test of the value of the pulp may be found in the following. The farmers in a community in California, living near a sugar factory, were selling milk from their dairies to a dealer in Oakland, and all but one were receiving the uniform price of nine cents per gallon; that one, Mr. P———, received ten cents. Frequent inquiries were made of Mr. P——— by his neighbors how it was that he received the extra cent per gallon. After awhile Mr. P——— ran out of beet pulp which he had been feeding to his cows and soon be received word from the dealer, "What is the matter with your milk? Can pay you but nine cents, same as the rest;" later the sugar factory started up and a team was sent the next day for pulp; in a few days word came, "Mr. P——— your milk is all right again, can allow you ten cents." This testifies that the beet pulp as food for the dairy cow adds 10 per cent to the value of the milk, while others who have tried it say that it adds to the quantity.

The first week or two after the factory at Bay City started, farmers' teams crowded in with their loads of beets and went away empty, but

later, after an occasional one had ventured to try the pulp, every week more and more teams went to the pulp spout or to the pulp pile, until towards the end of the campaign the largest crowd of teams was at the pulp end of the factory, and today nearly all of the pulp is gone and the farmer has found out its value as food for stock.

QUALITY OF THE SUGAR.

Before closing, I might say a word regarding the quality of our domestic beet sugar. It is said the "Test of the pudding is in eating it," so with beet sugar made in Michigan, its purity is ascertained by its use. Dealers once distributing it to their patrons had occasion to keep it in stock.

An analysis at the Michigan Agricultural College testifies to its being 99 7-10 per cent pure; one made at the pure food department in Chicago 99 85-100 per cent pure. This quality of sugar we may commend to the people of Michigan for use freely and abundantly without fear of deleterious effects upon the health of the most delicate. It is an article of food which, if produced in abundance, its consumption will increase until the ratio of consumption will reach ninety pounds per capita in this country.

In planting one hundred thousand acres of our tillable land to sugar beets we would detract so much from acreage now sown to wheat and other grains and it would lighten our market for grains by so much as the crops therefrom would amount to, thus leaving an increased demand for those who have no market for beets and who for any other reason cannot raise them.

It is said that more goods have been sold in Bay City the past year than for many years previous; that more than two hundred wagons have been sold in Bay City and vicinity the past six months prior to January, 1899. One merchant has sold more carpets to farmers the past season than for six years previous.

With these facts before us would it not be well for the legislature to proceed carefully in measures looking to the repeal of the bounty law? If this prospect can be followed up, if the opportunity now offered our people shall not be lost to view, but fostered and seized upon and improved, may we not expect in a few years to see Michigan producing her own sugar; possibly selling some to neighboring states, and thus utilizing the money now paid out for this most valuable and necessary commodity, building her home industries, adding yearly to her wealth and her commerce, and thus advancing her relative standing in the family of states?

DISCUSSION.

Mr. Alexander: We have been guaranteed help. Can we depend on it?

N. B. Bradley: I do not know as to this particular case. Money will hire help at almost any time. There are many people in Detroit and probably in this immediate vicinity who will be ready to work for a fair compensation.

Geo. C. Peterhans: What is done with the pulp?

N. B. Bradley: It is hauled away by farmers for feed to cattle and sheep. The more of it they feed, the better the farmers like it.

L. A. Hunter, Lyons: Would it not be better if the law allowed a certain fixed price for beets regardless of sugar content?

N. B. Bradley: No, it is better as it is.

Q. Can't a factory store the beets better than the farmer?

N. B. Bradley: No, certainly not. It would require sheds covering many acres

to store beets enough to run the season. The farmer has simply to pit the beets while he has a big gang of help, then haul at his leisure later when the factory calls for the beets.

L. A. Hunter: In Binghamton the farmers prefer to harvest as rapidly as possible with a big gang of workmen, then haul later. They think it cheaper than to harvest and haul at the same time.

G. Beckley, Midland: Do beets deteriorate by freezing?

N. B. Bradley: No; the factory is now working altogether on frozen beets. It will not do to allow the beets to thaw and freeze again, but if they freeze and stay frozen up to the time they are worked, the beets are not seriously injured.

J. H. Campbell, Big Beaver: At what price in Chicago was Bay City sugar sold?

N. B. Bradley: The factory at present lacks store room for sugar, a defect that will be remedied before next season. On this account, however, some sugar was forced on the market at a slightly reduced rate.

Mr. Chamberlain: What objection is there to storing beets in a cellar?

N. B. Bradley: Too much work and liable to be too warm at times, and at times danger of freezing.

E. B. Graham: How far can beets be shipped by rail?

N. B. Bradley: The railroads give special rates on beets that enable them to be profitably grown many miles from the factory.

Geo. A. Wells: If contracts are not in accordance with State laws, can the factory draw bounty?

N. B. Bradley: Probably not, but this is a legal question that would have to be settled for each case.

L. D. Snook, Pontiac: If a beet freezes and thaws is it spoiled?

N. B. Bradley: Yes. If a beet freezes, keep it frozen until delivered.

L. A. Hunter: Do beets deteriorate in storing?

N. B. Bradley: Not if pitted, but if in cellar they are liable to wilt and thus lose value.

Q. How about the experience of Mr. Silcox?

J. Y. Clark: As the statements have appeared in the papers the facts are not squarely stated. Mr. Silcox sowed three acres and harvested hardly one, yet he charges all the expenses for the three acres against the meager returns from one acre. He seems to have tilled the beets fairly well in the early part of the season, but neglected them later so that he did not gather the beets at all from the weeds and grass on part of the area. The beets were below standard and the whole enterprise was a failure.

P. G. Towar, Lansing: I happen to be a neighbor of Mr. Silcox, and I can assure you that there was more to this failure than has been brought out here today. He took care of the beets so poorly that they could not grow, and as a matter of fact he did not try to harvest the whole area planted, but contented himself with pulling a few beets here and there over the patch.

Q. How about the shrinkage he reports?

N. B. Bradley: The sugar company has nothing to do with the shrinkage. The amount of tare is determined by a State officer, who is impartial and gives general satisfaction. There are, as far as I know, not more than three or four farmers about Bay City who raised beets last year that are dissatisfied. The delegation visiting the factory from Alma stood about the gates of the factory all day, talking to farmers. They reported on their return home that the sugar beet growers were the happiest lot of farmers they had seen in many a year.

SUGAR BEETS: A WORD OF ENCOURAGEMENT AND A WORD OF WARNING.

PROF. C. D. SMITH, AGRICULTURAL COLLEGE.

The word of encouragement I shall give is simply this: Southern Michigan is in the very heart of the beet belt as far as climate is concerned, and possesses a soil over most of her territory well adapted to growing roots very rich in sugar, as rich, on the average as any other state in the Union, and richer than any other with the possible exception

of New York. Through the courage of our friends at Bay City the making of sugar from beets has had its inception, and from the experience of factory and farmers we may learn many valuable lessons as well as receive much very solid encouragement.

How great the profits of the factory may have been, from the campaign just closed, I do not know, but I have visited the factory many times; have met the farmers frequently; have studied their methods somewhat thoroughly, and investigated the financial results of their enterprise. I am glad to report that the cases are few where the farmer has not made a large profit over all expenditures, including pay for his own time and for the labor of his teams.

CASH PER ACRE.

The farmers managing their work intelligently and keeping a careful account with their fields report, giving itemized statements, a cost per acre of amounts varying from $30.00 to $45.00. A careful review of the reports from some forty farmers leads me to believe that the cost of raising, harvesting and delivering an acre of beets at a distance of three miles does not exceed approximately thirty-two dollars, where the work is economically managed.

Where unusual pains are taken in the matter of cultivation and hoeing the cost may run higher, but if it does the yields are correspondingly enhanced.

RETURNS PER ACRE.

On the other hand, I found the returns per acre to vary from forty-five to eighty dollars and in exceptional cases to a much higher figure. The net profit per acre seldom fell below twenty dollars and often ran above thirty or even forty dollars. This is the word of encouragement. At the present prices paid for beets there is a good profit to the grower.

NOW FOR THE WORDS OF WARNING.

1. Don't locate factory where cheap coal and limestone are not easily obtainable, or where there is not a large supply of pure water free from potash salts especially, to be had without pumping.

2. Don't go blindly into a contract with a construction company for the erection of a factory. It has the experience and you the money when you begin, how will they be divided when you end? Go into the thing on business principles.

3. Look up the element of labor. When you remember that it takes one man fully seven and a half days to thin an acre, and farther that the period of most economical thinning extends but two weeks after the beets are ready, you will see that you need for this job one person to every two acres of beets. Before deciding therefore on how many acres he will put in, the farmer needs to cast about to see how many persons he can command to do the thinning. This job commences just before haying and may last long enough to overlap the latter job.

Again, harvesting the beets is another job that requires lots of help. It comes in late September and early October, just as the corn is ready to harvest. It is well to see if plenty of extra help is available at that

time of year, before going too heavily into beets. Other things are going to be raised on the farm as usual and will require the customary amount of work. How much additional help is available in the community for this new crop?

The success of sugar factories in this State, well placed and wisely managed, is practically assured. The profit from beets planted on soil adapted to the crop, intelligently cared for, harvested, siloed and delivered to the factory has been demonstrated. What we need to guard against is misdirected effort, unwise location and unhealthy excitement, followed by untimely and hurtful reaction.

DISCUSSION.

Mr. Alexander: Are beets liable to drop in price on the withdrawing of the bounty?

C. D. Smith: Undoubtedly, to some extent. As soon as the bounty is taken away the struggle between factory and farmer as to division of the profits will begin. The former will strive to make the price as low as possible and secure the requisite acreage of roots, and the latter will seek to get as high a price as he can and allow the factory a living interest on the capital invested.

Mr. Grayley: How is potato ground for beets?

C. D. Smith: I know no reason why it would not do. Later we shall have to adopt systematic rotation in which beets will follow some cereal.

Mr. Bailey: I want to ask Mr. Clark which kind of soil gave the highest per cent of sugar?

J. Y. Clark: I don't know.

Mr. Sailor: How much has the location of the factory at Bay City raised the price of land?

N. B. Bradley: Certainly $25.00 per acre. It has given a large impulse to all farming industries.

J. L. Morrice, Monroe : Beets grown on different classes of soil on my farm and sent to the Agricultural College for analysis showed

Seven per cent on sand; 11 per cent on clay; some of the beets weighing as high as six pounds.

Mr. Jewell: I raised beets on sand, clay and muck with these results:

On muck the beets tested 16 per cent, 80 purity.

On clay the beets tested 14 per cent, 80 purity.

On sand the beets tested 12 per cent, 80 purity.

On the muck the beets were deeper in the ground than on other soils.

C. D. Smith: It should not be forgotten that it is not the proper function of the Agricultural College to promote an industry. Its duty is done when, through various channels, it furnishes information useful to the farmer concerning the industry.

WEDNESDAY AFTERNOON.

E. A. Croman, Grass Lake, presiding.

QUESTION BOX.

Q. Have you considered how many acres of beets each farmer in Oakland county must raise to supply a factory?

J. Y. Clark: There are five thousand farmers in Oakland county, so that the matter of labor is not a serious one here. Besides, we are near Detroit.

A. E. Vantine: If it is a paying thing, why do manufacturers want a five year contract with the growers?

C. D. Smith: The manufacturers have $350,000.00 invested in a plant which is good for nothing but to make sugar from beets. The farmer has his capital in land that he can turn to a variety of crops. If, at the outset, there should be a bad year for beets, the farmer will refuse to raise beets unless he is bound to do

so by contract. After that business is once on its feet the farmer will need no contract to induce him to grow the beets necessary to support the factory.

Q. Will it pay to rent land to raise beets?

N. B. Bradley: Certainly it will. It is better to pay a money rent than rent on shares. One man, sending beets to the Michigan Sugar Co., paid $6.00 per acre rent for 100 acres. The returns were $55.00 per acre, leaving him net $2,100.00.

Q. Will tile drained, quick-sand bottom, tamarack lands do for beets?

C. D. Smith: I should be afraid of them, afraid of frosts among other things. Try them on a small scale.

Wm. Casement: What is the feeding value of sugar beets to milk cows, milk selling at $1.80 per 100 lbs., and to fattening cattle, when beef is worth $4 per cwt?

C. D. Smith: It is hard to fix a definite price without knowing the other components of the ration. It would not be far from $3.00 per ton.

W. Schlichter, Brown City: Will a factory take beets topped at home?

N. B. Bradley: What the factory wants is the part of the beet testing over 12 per cent sugar, the part below the ground only. Don't pay freight on the tops or part of root above ground. Keep those parts at home.

Q. Can beet seed be sown with a common grain drill? How do you regulate it?

F. W. Dunham, West Bay City: I sowed 5 acres in rows 20 inches apart with drill, and harvested 21 tons to the acre, getting a gross return of $464.36 from the five acres. Put the delivery on the oat side of the feed, and set drill to sow largest possible quantity of oats. I use a Champion drill.

Q. Why is Mr. Ross going to raise beets this year, 1899?

A. L. Ross, Oakland County: I visited Bay City and found the farmers all satisfied with their success last year. I read what Secretary Wilson said about beets succeeding to the place that lumbering has occupied and that Michigan was in the very center of the beet belt, so I made up my mind to try it.

Q. How is it that 65,000,000 pounds of beets testing 13 per cent sugar only yielded 5,500,000 pounds of sugar, or less than 9 per cent? What became of the rest?

N. B. Bradley: I have given you the results for this year. We were pioneers and made the mistakes of pioneers without experience. We will do better next year with our increased knowledge and improved methods and machinery.

Q. Will the profit the farmer makes from an acre of beets pay the bounty on the sugar made from it?

N. B. Bradley: If he has a yield of 12 tons and the factory gets 180 pounds of sugar per ton of beets, the acre will yield 2,160 pounds of sugar, on which the bounty will be $21.60. The farmer would make probably a profit of $30.00.

Q. Is any attention paid to the coefficient of purity in paying for beets?

N. B. Bradley: No. The law is silent on that point; a high coefficient means that beets work more easily, but whether we can secure more sugar from beets showing a higher coefficient than from others with same per cent of sugar we shall have to find out.

S. Brickner, Brown City: Will the farmers continue to raise beets in your section?

N. B. Bradley: Yes. All patrons but possibly three will continue to raise beets. All are contented and happy over the results.

Q. Would it be possible to get a factory now if preliminaries were all settled?

N. B. Bradley: Yes, if everyone connected with the enterprise moved vigorously. There certainly is no time to lose.

THE IMPORTANCE OF MIXED FARMING.

HON. H. H. HINDS, STANTON, MONTCALM COUNTY.

To the scientific investigator as well as the specialist in practical lines we owe much, very, very much. Notwithstanding all this, during our time, and during the time of some generations still unborn, the great bulk of agricultural products of Michigan, not excepting butter fat or even sugar beets, will come from the farms of men who are pursuing mixed husbandry.

Continued success in farming is stated in a single short sentence and

is as follows: Keep up soil fertility and conserve moisture. Soil moisture is successfully conserved in fields where frequent cultivation is possible, mechanically—that is to say, by certain ways of tillage. The maintaining of soil fertility is best assured under a system of mixed farming—that is, the growing of forage and grain crops, selling some of the latter; and the rearing and selling of live stock and live stock products.

I am not now about to slander the good name of my county or the little city in which I have resided for a third of a century. I am bound, however, to say that my farm experience has been acquired under as grave and adverse climatic conditions as exist in Michigan. I speak from hard experience in a section of the State that lies probably fifty miles north of the north line of the frequent trans-continental storms which pass around rather than across the south end of Lake Michigan. The location is less than that distance south of the south line of the trail of the great storms that are associated with the history of the Straits, the Upper Peninsula, Lake Superior and the Dakotas. I judge that so far as climatic conditions are concerned, statements as to practical maintenance of soil fertility and conservation of soil moisture which will operate at Stanton, will work as well in other parts of the State.

I might say in passing that in the little hamlet in which I reside, the commercial fertilizer dealer has not as yet made his advent. The high smelling phosphate bag has not as yet perfumed the air as it fell over the tail board of the farmer's wagon on his return from the corners where he had been to market. Farming in my vicinity has only shown a profit in cases where the farmer has trusted in providence and—kept his powder dry.

How then may we fairly expect, under general climatic conditions of Michigan to maintain our soil fertility, and at the same time make agriculture fairly profitable? I answer by pursuing a practical, rational system of mixed farming.

THE SHEET ANCHOR OF THIS SYSTEM IS CLOVER.

Given we can grow clover, and such other crops as we desire to produce are assured.

Can we grow clover? Probably always if the soil is not too nearly exhausted, and the clover is given a fair chance for its life. The clover has many insect or parasitical enemies, which come and go, and they are frequently fatal to the plant. We will pass them all by in this discussion and consider only the farmer's part in trying to grow a clover crop. Clover is by no means certain to make a stand if grown with what is called a nurse crop. For instance, clover is sown on good well tilled land in the spring in a crop of growing wheat. The seed germinates, makes a good showing in the shade of the growing wheat and at harvest time shows a complete stand, but the plant is small. A crop of say 20 to 30 bushels of wheat is cut. The shade to which the clover had thus far accustomed itself is removed, and unless frequent showers are then the rule (an unusual thing in my locality) the clover plants have all disappeared by the time the last load of wheat is hauled out of the field. You may always expect a catch of clover under two different plans of procedure. One plan is to plow your wheat stubble after harvest. Till as though for wheat, only not so deep, and sow to clover in August or early

in September. You have a fair crop of clover the next year and a good one the year following. The other plan is to plow in the spring and fit as for oats, and sow clover without nurse crop. Run mower over field twice during latter part of summer, and let the clippings lie where cut. A great crop of clover is assured the next year. Under either of these plans timothy may be sown if mixed hay is sought.

THE CLOVER GROWN; WHAT NEXT?

Shall we plow it under, in our system? Plowing under is no doubt a good plan, but a much better one is to harvest the crop and feed it out. Properly cured clover hay is the nearest approach to a perfect food for our domestic animals, of any single thing that we can grow or buy. It should enter largely into the feed rations of our horses, cattle, sheep and swine, even the poultry reciving occasional allowances of it in winter. Given that adjacent farmers are rearing stock, feeding for market, or are engaged in dairying. The one using a liberal allowance of clover hay, and the other none. No attempts at scientifically balancing rations by the latter will prevent his falling to the rear of the former, if all other conditions are equal. The chemist cannot absolutely point us the way, and the vender of commercial fertilizers is not with us. We are all however, very well aware that a successful way of maintaining the soil fertility of a farm is to use upon it all the barnyard manure obtainable. To secure barnyard manure, carry all stock necessary to consume the forage and coarse grains grown upon the farm. To carry much stock we should grow a liberal amount of forage.

The forage crop that is up and away in advance of all other forage crops in the production of a maximum amount of food with a minimum amount of labor, is the giant grass, corn.

CORN IS KING,

at least of Michigan forage plants. How shall it be grown and utilized in our system of mixed husbandry? The clover plant—the legume we have been considering—has fixed the corn field. Its wonderfully long roots have gone down and brought within our reach fertility that was stored beyond our depth. Its foliage has gathered from the atmosphere chemical properties of the highest importance to the agriculturist. It has even changed the color of the soil. We have an ideal field for corn. Any available barn yard manure to devote to this field has reached it during the winter and spring. As to the propriety of properly plowing and thoroughly fitting this field, we are all agreed. We grow, harvest and feed the crop differently. My plan is substantially as follows: Plant from May 20 to 30 with corn planter and check rower. One man with road team plants 40 acres in two days, taking it as the drag leaves it and it is rowed both ways. Commence cultivating the crop within a week by dragging. As soon as corn shows well abandon drags and cultivate. Have attachment that cuts off the weeds. Use small and numerous teeth. Cultivate level and fine but not deep. Cultivate often. Once a week if possible. By keeping the soil level and fine at the top, even though dust flies, you conserve soil moisture, and facilitate the crop getting its needed moisture by capillary attraction. Under such conditions the corn grows on, and it does not roll even though rain should not fall

for weeks. When the crop cannot longer be cultivated the weeds may still attempt to grow. In August pass through the field and pull by hand all remaining weeds. This is a small job, but if neglected the field will show it in after years.

THE SUBJECT OF HARVESTING

must now be taken up. If you have a milk trade or are pursuing dairying that needs a liberal flow of milk through the winter, a silo is essential. The silo should be round and as deep as it is practicable to fill it. Silage is a succulent and palatable food and undoubtedly assists in the digestion and assimilation of dry foods. All domestic animals like it. The silo, however, creates nothing. There is, of course, more or less loss. No other crop but corn has been found practicable in this State for silage. I have put up and used large amounts of it. I should annually use it liberally if I were interested in winter dairying. My pits are square and the loss in such is much greater than in round pits. The loss on the grain content of silage is much more than upon the balance of the corn plant. If your corn plant is carrying 100 bushels or more of corn per acre it is too rich for economical silage. There will be large loss on the corn content.

To ensilo our corn crop, that is now grown, is not the most economical way to utilize it in an ordinary system of mixed farming. The actual crucial test as determined by absolute results in figures will show that among the most economical ways of harvesting and using at least a liberal percentage of this corn crop is to cut it with machinery and

SHOCK IT IN LARGE SHOCKS

in the field, and draw it thence without husking as needed directly to the fields or yards where the farm stock, both growing and fattening, consume it. In this manner of handling the crop, the corn content is cured and preserved in the most perfect condition and without appreciable loss. The forage is in elegant and palatable shape on all but the exposed parts. On the outside of the shock some damage is done to forage. This item of loss should receive due consideration. I am assuming that such corn as is husked in this field will not be sold in the crate. It should be sold in the hide or as butter fat. The fine steer will husk his own corn, if desired, and carry 100 bushels of it down to the station and up into the car and if in the process he has scattered some, the fine pig will gather it all up, follow the steer to the station, and go to market in the next car to the steer. In utilizing the crib of corn husked from this field, you will seldom need to go to mill except for some corn and cob meal you may desire to mix your cow's ration. For the horses, hogs and sheep, it is better not to shell it. For cattle, when the corn gets dry and hard in summer, it is better to either soak or shell it.

The corn field we have been considering is in ripe condition, free from weeds and well cultivated. It

MAY BE SOWN TO WHEAT AT ONCE,

or it may go over to spring and be sown to oats or barley, if these crops are grown, or it may be planted to corn the second time with the expecta-

tion that the second crop of corn will be heavier than the first. In this system of farming we should contemplate raising our own stock, even to horses. In the matter of raising cattle, we should contemplate raising the calves on separated or skim milk. Turning butter fat in the shape of whole milk, down the throat of a lusty growing calf is not to be commended as an economical measure. It is not likely to injure the young animal, but, like plowing under clover hay, it may be classed as extravagant farming. The lacking fat in warm separated milk for a young calf may be supplied by adding cooked flax seed meal, and older calves may safely be fed whole grain so soon as they eat hay and ruminate. The farm cows, therefore, should help out to a noticeable degree the farm income by their work in the dairy.

THE HOG IN MIXED FARMING

should invariably be found. This animal is the natural farm gleaner. He very successfully harvests the wastes of general farming. He successfully gleans the grain fields and harvests the cull fruits. Stale general supplies he removes from sight, and when his nose is ornamented with a ring, he renders a fair account for his presence in a clover field.

SHEEP SHOULD ALWAYS BE RECKONED

among the very desirable farm stock. Weeds, briars and brush disappear from the farm soon after the advent of the sheep. In fact the man engaged in mixed farming, not having his eggs all in one basket, if he falls usually lights on his feet. There are but few days in the year when he has nothing to sell. In selling, however, it should be the aim to sell the finished product. Make the stuff ripe. Sell a high class product. If roughage is to be sold, sell straw. Don't sell clover hay or corn stalks. Should you desire to buy additional feed stuffs to help soil fertility, buy wheat, bran, cotton-seed meal and oil cake. The man in mixed farming may safely maintain a small orchard, and may profitably grow a few acres of potatoes, or even sugar beets on the side. Many of this class of farmers grow beans with satisfactory results.

The farmer engaged in mixed husbandry may not produce such extreme amounts as are shown in some cases by the specialist, but he can with ease turn off a product of the highest quality from a commercial standpoint, and at a minimum net cost of product to challenge competition. In the highly important item of maintaining soil fertility, no other system is in the running with him.

DISCUSSION.

LED BY HON. PETER VOORHEIS, PONTIAC, OAKLAND COUNTY.

We are not in farming for fun but for finance, and hence have adopted mixed farming. Success depends on skill in management. If the details are properly looked after, success is reasonably certain.

Mr. Hinds does things on a large scale; this we all of us cannot do. We must do things in a smaller way and get our funds from the carefully husbanded products.

One of the first lessons we must learn is to make our farms produce at a minimum cost. The Rural New Yorker reports the experience of a farmer who was

able to raise corn at six cents per bushel. We must compete with intelligent farmers and must therefore develop ourselves to meet this strong and intelligent competition. In the second place, we must always have something to sell. It is true that a farmer sometimes makes a lot of money from the sale of a single crop of potatoes or fruit. His neighbors are then likely to go into the given crop as a specialty, sometimes with success, but more often mixed farming is by far the safest.

Mixed farming is not only safest; it develops the farmer best because bringing into use so many varied faculties and requiring a much broader knowledge than does any one specialty. It moreover brings you into contact with men.

A wise farmer uses a discriminating judgment, selecting men, tools, seeds, and live stock, getting the best of each, the article best adapted to his business and his situation. A wise farmer manages. One neighbor works hard himself, while his hired men, scattered all over the farm, fool away time. Another neighbor uses his hands less and his head more. He keeps his men together and directs them himself, and accomplishes much more with the same help than his harder working neighbor.

A visit to a neighboring village revealed the fact that the owner and manager of the bank was also the owner and manager of a woolen mill, cheese factory, and various other lines of business. By thorough organization he was relieved of details, and the business as a whole was a most emphatic success. Diversification of business develops the organizing and administrative abilities of the man.

N. B. Bradley: A man that undertakes too many lines of business is liable to fail in all of them and be a curse to the community in which he lives.

J. J. Lautenschlager: How does Mr. Hinds sow clover seed?

H. H. Hinds: With the grain drill.

Q. How do you fit corn stubble for clover?

H. H. Hinds: Sow oats light—a bushel to a bushel and a half per acre, and with the oats sow four quarts of clover seed.

N. P. Howell: Why not haul the unhusked corn to the barn to store it?

P. Voorheis: I tried that, hauling two or three loads in at a time, but it would heat.

H. H. Hinds: Don't draw your corn to the barn or to big stacks. Leaving in large shocks, well bound, is the best way.

Mr. Hunter: Is a corn harvester practical?

H. H. Hinds: The world is waiting for a satisfactory corn binder.

Mr. Hunter: Corn binders are not yet perfect, but they are fairly satisfactory, leaving bundles in good shape for husking.

Mr. Green: What variety of corn would you recommend?

H. H. Hinds: Any kind that fully matures, giving a good ear and stalk. I use a variety called the Minnesota King.

Mr. Ball: Would you advise farmers to feed their whole crop from the shock?

H. H. Hinds: No. We want some corn to grind, and therefore part of the crop must be husked.

H. H. Green: How do you manage in thawing weather when the field is soft and muddy?

P. Voorheis: There are always some days when you can draw. Then haul in a supply for several days ahead. I have had little trouble on this account or by freezing fast to ground either. I usually pitch the corn on the wagon with a fork.

THE IMPROVEMENT OF THE SOIL THE FIRST FACTOR IN GREATER AGRICULTURAL PROSPERITY.

HON. GEO. T. POWELL, GHENT, NEW YORK.

Farmers have realized that for the past quarter of a century there has been a most serious depression in the value of land, as well as the value of its products. While our soil has been greatly depleted through long years of production, which is destructive in its processes, it is by no means exhausted of its plant food. The Creator has been wiser than to make it possible for one generation or for many generations, to exhaust

the fertility of our soil. He has so abundantly endowed the soil with plant food that it will yet feed generations of people for thousands of years to come. But future generations will have to study new problems in relation to unlocking and obtaining the plant food that it still abundant in our soil.

TILLAGE.

We must now study the subject of tillage in an entirely different manner from what we have done heretofore. If I were to ask this audience what is the primary object in tillage doubtless many would say that it is to keep down the growth of such plants as will interfere with the growth of those which we wish to cultivate. I do not look upon tillage as having this for its prime object, but rather as a means of more largely making use of the plant food that it still abundant in our soil.

PLOWING,

is a work that is not being done today according to the requirements of our times; we have too much crude, rough work in plowing, and in the preparation of our soil for the crops we desire to grow upon it. In fact, the great fault with our farming is that we are trying to work over too many acres, and not working them sufficiently well. Greater agricultural prosperity in the future can only be realized by changing our extensive to the more intensive system of culture. We need to study the construction of agricultural implements—especially the plow. Two plows not long since were brought to my own farm, and the claim made for one was that, if properly adjusted, it would run a certain distance without any one holding the handles. The same claim was not made for the other plow. They were set to work, and one did, as was claimed, run through the soil for quite a distance before it turned and went out of the soil. After they had been used for a time the condition of the work was examined after them, and it was found that the easy draft plow had not left the soil in anything like the pulverized condition of the other, and, while the second plow was rather harder on the team, and a little more work for the man who held it, it was purchased for the reason that its work was considered to be worth at least one hundred per cent more than the light running plow.

THE IMPLEMENTS FOLLOWING THE PLOW

should be constructed upon the same principle for still further refining and reducing the soil, the object being kept in mind that all of this work of tillage must tend in the direction of getting at the wealth of plant food that is underneath our feet. Cultivators and harrows of different kinds should also be used, one after the other, so that when the soil is prepared for a crop it will not be necessary to call upon the commercial fertilizer to bear so large a part in the growing of this crop. I look upon

TILLAGE IN ITS SECOND IMPORTANCE

as controlling the moisture that must enter into the perfection and fullest development of the crops we are growing. We cannot depend upon the rainfall during the season of any growing crop to perfect it. It is no-

where near adequate to that purpose, and hence we must depend to a large extent upon the supplies of moisture that have been accumulating in the soil during the late autumn and the winter months. The reservoirs are now well filled, and it is from these reservoirs in our sub-soil that we must depend very largely for our supply of moisture during the growing season. Tillage means, then, not only improvement of the soil, through its finer mechanical reduction of the particles of the soil, but it means to us the proper distribution of moisture during the entire growing season. Tillage should be deeper during the early part of the season for the purpose of admitting the warmth of the atmosphere—for the purpose of admitting the atmosphere itself—and this can only be done wisely while the plants are small, and their roots have not extended far into the soil. As the season advances, and the hotter days of the spring and summer come on, the waste of moisture becomes very much more rapid through the processes of evaporation, and as the season advances and the roots of plants are reaching farther and farther out into the soil the cultivation should grow lighter, and should become more frequent until the surface soil is made so fine that there is no possiblity of escape of moisture, except as it shall be through the plants themselves. The rolling of the leaves of the corn plant in times of drought is the indication to us that the plants are suffering for want of water, and if we, at that time, will begin a vigorous round of cultivation, going over the fields each day, we shall so check the waste of moisture, even under these conditions, that it will be possible to supply the corn plant with needed moisture, and unroll its parched leaves. So that the second prominent object in tillage which will apply to all of the cultivated crops upon the farm—to orchards, or vineyards, or small fruits—is this right distribution and holding back of the great water supply in our sub-soil. And we can do far more than we have been doing to incorporate in our soil very important vegetable matter which will aid us very greatly in controlling the water supply. For several years I have been working upon the line of

REINCORPORATING HUMUS WITH THE SOIL,

which had been very largely used up and worn out upon my own farm, which has been under cultivation during a century and a half. After generations have grown wheat and other cereals upon it, I have been covering the same farm with orchards, and vineyards, and small fruits, and I have realized that there has been a necessity for reintroducing this very important element, humus, to carry through my crops successfully during dry seasons. I commenced by sowing buckwheat and rye in orchards, but for six years have been using, with very marked success,

CRIMSON CLOVER.

I will give you, in as brief and condensed a form as possible, the treatment under the crimson clover culture. All cultivated land is kept under the most constant tillage up to the middle of July; then, as tillage ceases, my practice is to sow ten pounds of crimson clover through all of the orchards, and cover lightly the seed with a smoothing harrowing. At the last cultivation of corn, the crimson clover seed is sown (ten pounds to the acre) and lightly covered with the one-horse cultivator. At the last cultivation of potatoes, the seed is sown in the same proportion. As

the small fruits are harvested, the ground is lightly plowed, thoroughly cultivated, and the same proportion of seed is sown in this. The plants will remain small until along in September, and, with the cool weather of approaching autumn, the plant begins to make its most vigorous growth, and by the time winter arrives there is a very fine luxuriant covering to the soil.

There is no doubt in my mind that the depletion of plant food is not so great in the products which we take from the soil as that which follows by its lying naked and uncovered for months after our crops have been produced—especially cultivated crops—to take the washing and the bleaching for months at a time. I believe there is greater loss of plant food following this system than in the actual production itself. It has been ascertained that the fall plowing necessary for the spring seeding, with the land lying naked for so many months, is resposible for the rapid deterioriation of the fertility of the soil in the spring wheat growing belt. We have long heard it stated by scientific authorities that the clover plant, with other plants of its nature known as the legumes, had the power to take from the atmosphere nitrogen, the most costly element of plant food, and, through bacterial agencies in the soil, build it up in large quantities. This statement has come very largely from laboratory experiments, and has been proven time and again to be true, but I have been demonstrating upon a large scale the extent to which this may be found to be true in the crimson clover for this purpose over an area of nearly one hundred acres, annually. I will here give you

THE RESULTS

which have been obtained in this direction, the facts of which are not only positive, but which perhaps may be very surprising to you. The figures upon this chart represent the analysis of samples of soil taken from my farm where three crops of crimson clover had been grown and plowed in continuously; and, to give a greater value to this work, a sample of soil was taken on an adjoining piece of land of the same general character and under the same treatment, with the exception that no clover had been used upon it.

Crimson Clover as a Green Manure—Analysis of Soils.

	Three crops clover. Per cent.	No clover. Per cent.
Water	15.00	8.75
Nitrogen	.21	.12
Humus	2.94	1.91
Phosphoric acid (available)	.015	.008

The difference in percentage below shows the larger amount of water, nitrogen, humus and phosphoric acid in the clover treated soil per acre.
Water, 6.25 per cent, equals 46,876 tons.
Nitrogen, .09 per cent, equals 1,350 pounds.
Phosphoric acid, .007 per cent, equals 105 pounds.

You will note in the analysis made for the water content of the soil the very wonderful

DIFFERENCE BETWEEN THE CLOVER TREATED SOIL

and that upon which no clover was used. The difference, as indicated upon this chart, of nearly forty-seven tons more of water to the acre where the clover had been used is one of the most important parts of this subject. I had demonstrated for at least two years in carrying through large crops of Bartlett pears at seasons when there was not sufficient rainfall from the time the trees had bloomed until the fruit was gathered to moisten the roots of these trees that they had not materially suffered from want of rain; and, while I know that I was getting satisfactory results from this clover treatment, accompanied by frequent tillage, I was surprised when the chemist—the scientific man—took my soil and found in his analysis that I was carrying this forty-seven tons more of water in my soil as one of the direct results of re-incorporation of the humus material in my soil. You will note upon this chart the significant figures upon humus that in the clover treated soil it is so much greater than in the other, and here is a very vital question for us to consider.

WHAT IS THE ACTION OF HUMUS IN THE SOIL?

It is in the addition of acid—the humic acid—which is created or developed, which is acting upon the mineral food elements of the soil, and making them more largely available as plant food. It is doing this because of its ability and its power to absorb and hold the moisture which is constantly seeking to make its escape from the soil during the hot weather, and the more we can incorporate humus in our soil the more successfully we can resist droughts. It acts upon the same principle as the sponge, by the way of illustration, which you all know has great absorptive powers. It will hold a large quantity of water, and it gives off this water slowly when thoroughly saturated. The crimson clover is adding to our soil millions upon millions of sponges which aid us in this matter of absorption and longer and more even distribution of not only the water that falls upon the surface, but that which comes from the subsoil. The figures upon phosphoric acid were as surprising to the chemist himself that he should find the larger per cent of available phosporic acid in the clover soil than in the other. But perhaps the most surprising part of all this work is the extent to which plant food in the form of

NITROGEN HAS BEEN ACTUALLY ADDED TO THE SOIL.

You will observe the percentages in the two soils, and when the figures were given of the difference of nine per cent in favor of the clover-treated soil over one acre to the depth of six inches, which was the depth to which these samples were taken (as we cultivate no deeper in our orchards), the very surprising results of over thirteen hundred pounds of nitrogen were found to be added by this clover treatment. Some allowance doubtless needs to be made for the nitrogen set free by tillage, but the clover plant has made, to a very large extent, this great per cent of nitrogen represented in these surprising figures. If I had added this amount of nitrogen to my soil from the phosphate bag, purchased at the lowest cost for which it can usually be obtained, at fifteen cents per pound, it would cost me $202.50 per acre. When this result was given to

me as a positive fact it has placed the whole subject of forming before me in a very different and a much more hopeful light.

I believe, today, it is within the reach of the American farmer to continue his processes of production and yet constantly and steadily

INCREASE THE PRODUCTIVE POWER OF THE SOIL.

This is a very strong statement to make, but I believe the possibilities lie in the future of getting as much wealth from the cultivation of the soil as at any time in the history of our great country, but we cannot do it practicing our old methods. We have got to be much more careful students of all of the processes which enter into production, and we must study not only to save the losses, but the methods by which we can keep up production and at the same time improve the productive power of our soil. I believe there is no greater field for young men today to enter than the field of agriculture if they will become the close students of the principles that underly soil management as they would to study for any profession which they might choose.

DISCUSSION.

I. N. COWDREY, ITHACA, GRATIOT COUNTY.

Led the discussion, emphasizing the importance of carefully husbanding the manure. It is folly to leave the manure spread out over a barnyard where the rains of fall and spring leach out the more valuable parts. It is better by far to preserve carefully and spread thinly over the fields. Good success has followed top dressing clover fields.

It is not necessary to keep a large amount of stock on a farm; fertility may be partly maintained by plowing leguminous crops, especially clover. On one occasion Mr. Cowdrey plowed under four tons of clover to the acre on a certain field and had excellent crops as a result.

Geo. A. Waters: Is crimson clover bad stock food?

Geo. T. Powell: There are instances in which the chaff has rolled up into balls in the stomachs of animals and has done serious injury to them. I don't advocate feeding it.

Q. Is crimson clover adapted to Michigan?

Geo. T. Powell: I wish to be understood in recommending to your State the study of this crimson clover culture that it is only as a means of improving the soil. There have been many failures in connection with its use, but they have been because the plant has not been studied or rightly understood. It differs in many respects from our other clovers—it is a foreign plant. It has been thought to be adapted more especially to warm climates, but as we study its nature and requirements its use can be very much more widely extended than is at present thought of. It being an annual plant, it must not be sown in the early part of the season to get the greatest benefit, but rather after the hottest part of the season is past. It grows best in the autumn months, and hence for this reason it is one of the most valuable plants to be used as a cover plant, which can be introduced only after our period of tillage has been closed. We must not sow crimson clover with reference to making hay of it, although it is excellent for that, but keep in mind the single purpose of an after, or cover, crop, to protect our soil during the winter months, and to do so especially after we have followed the high system of tillage which I am practicing and am recommending to you today.

Q. Will it go through the spring?

Geo. T. Powell: I don't want it to go through the spring—I merely want the aid which this plant can give me after I have finished the tillage of my soil. I want the humus which it will give to the soil. I want the nitrogen which it is fully capable of supplying in an all sufficient quantity from July to January. I merely want it to hold and protect my soil during the winter, and in the spring I care not

if there is not a live plant left of it. We should not allow it to grow in the spring in our orchards or among our fruits, for it will begin to take out more rapidly the moisture, which is the very thing we don't want it to do. When this plant covers the soil well we can get upon the same soil at least ten days earlier in the spring for the very reason that on the first approach of the warm days it begins to take out the moisture, and hence has put the soil in better condition to cultivate much earlier than the soil which is uncovered, and for that very reason we want to plow it in at the very first opportunity that the soil is in proper condition to work. So you need to keep distinctly in mind the object for which we use this clover, which is purely to improve our soil.

Mr. York, Tuscola County: May we not use red clover instead of crimson clover?

E. A. Croman: Yes, for ordinary purposes.

Mr. Campbell: I began my experience with crimson clover by sowing it wrong. I now sow in July. I have 22 bushels of seed, the product of two acres. I have sowed crimson clover both in orchards and standing corn with good success. It stands the winters all right with me when it is properly sowed.

A. M. Welch, Ionia County: How often do you cultivate corn?

Geo. T. Powell: As often as possible, certainly once a week up to July 10. We cut our corn and feed to hogs, follow with oats and seed to crimson clover. If I kept a dairy herd I would put the corn in silos.

Q. Do you plow deep or shallow?

Geo. T. Powell: Depends on conditions, depth of subsoil, and previous treatment.

Mr. ————I prefer alsike to any other kind of clover I have used, especially for low land.

Geo. T. Powell: While I like alsike for feeding much better, of course, than crimson clover, still the latter fits so perfectly into the wants of the orchardist, sown in July or August, growing rapidly through the fall, covering the ground during the winter and furnishing abundant green manure the following spring, that I regard it as one of the best and most useful adjuncts of the orchard.

J. Y. Clark: I would like to know the relative efficiency of the two clovers as nitrogen traps. Could not red clover be used in place of crimson clover and stand the winter better?

Geo. T. Powell: Both are nitrogen gatherers and of approximately equal merit in this respect, but I want to get all the growth I can in the fall, and this the crimson clover, being an annual, gives me. The root system of the crimson clover is unlike that of the common red clover—it has no tap root. Nine-tenths of the recorded failures with crimson clover are due to low quality of the seed. The variety with white blossoms is comparatively worthless. Imported seed is liable to bring in canker, which is dangerous. Old seed loses vitality, hence use alone the seed of the year you sow it.

Mr. Sailor, Grand Traverse County: Do you recommend subsoiling for corn?

Geo. T. Powell: I doubt whether we can afford it.

Q. What are wood ashes worth?

Geo. T. Powell: It is hard to answer definitely. The trouble is we cannot depend on the content of potash. Sometimes we get as high as five per cent and sometimes not more than half that amount.

C. E. Mills, Antrim County: Would you advocate crimson clover as far as 250 miles north of here?

Geo. T. Powell: Yes, on sandy loam, but not on stiff clay.

Q. How could Mr. Cowdrey get four tons of clover on an acre to plow under?

I. N. Cowdrey: I drew out several tons of clover hay that was spoiled by rain, then there was growing in the fall fully one and one-half tons per acre which fell down, then in the spring there was certainly enough young clover growing to produce a ton per acre of cured hay. This body of green and dead clover was plowed under for corn.

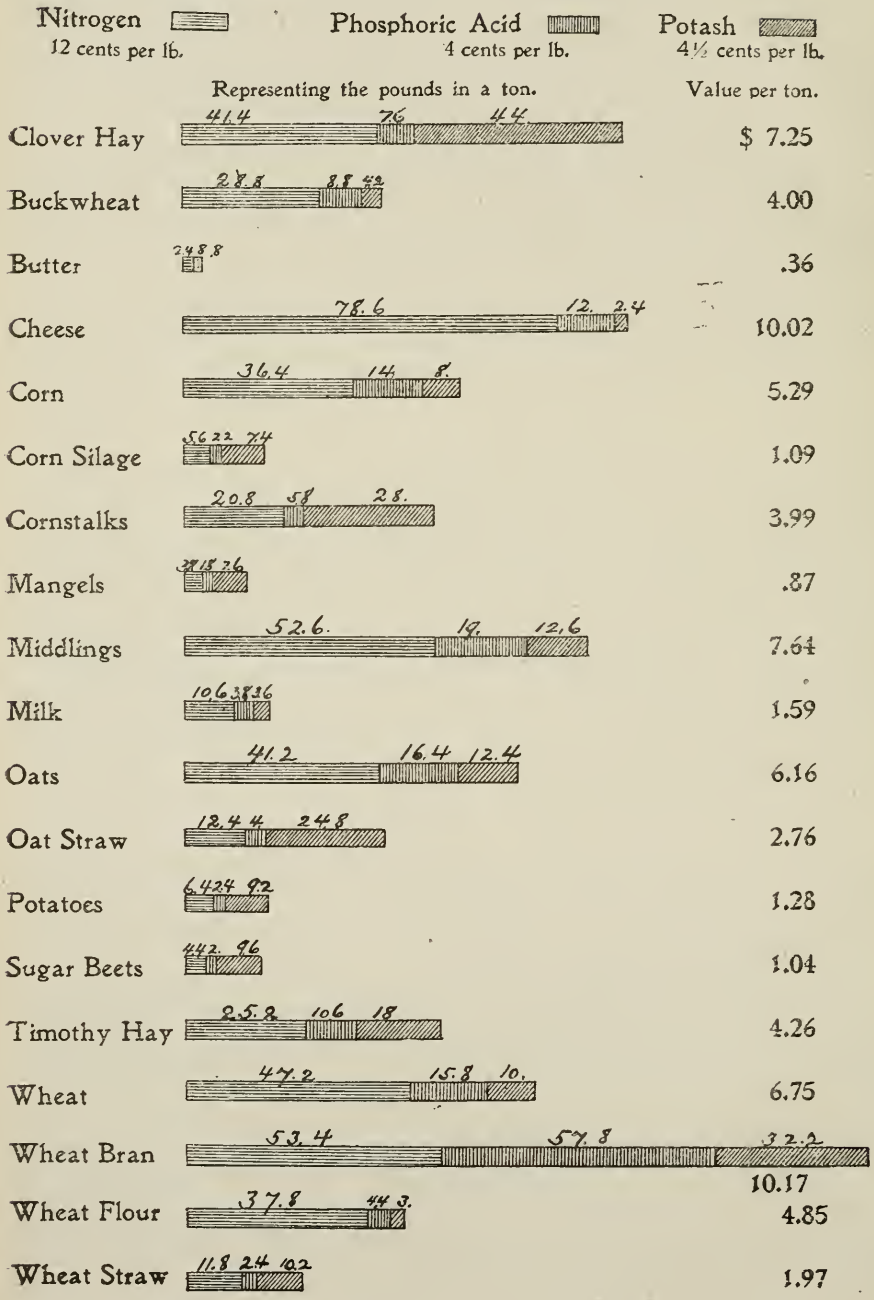
F. W. Dunham, Bay Co.: How do you get good crimson clover seed?

Geo. T. Powell: I always buy seed in Delaware of parties who make a business of producing it. With good seed there is no trouble about growing the crops.

Q. What is the value of summer fallowing?

Geo. T. Powell: It is of some value, but I cannot afford to follow the practice. Tillage renders the plant food in the soil available, it is true, but a farmer should be growing a cultivated crop and so tilling it as to secure all the benefits of a summer fallow.

FERTILIZING VALUE OF OUR FARM PRODUCTS.


Nitrogen
12 cents per lb.
Phosphoric Acid
4 cents per lb.
Potash
4½ cents per lb.
Representing the pounds in a ton.
Value per ton.
Clover Hay 41.4 76 44 $ 7.25
Buckwheat 28.8 8.8 42 4.00
Butter 2 4 8.8 .36
Cheese 78.6 12. 2.4 10.02
Corn 36.4 14. 8. 5.29
Corn Silage 5.6 2.2 7.4 1.09
Cornstalks 20.8 5.8 28. 3.99
Mangels 3.8 1.8 7.6 .87
Middlings 52.6. 19. 12.6 7.64
Milk 10.6 3.8 3.6 1.59
Oats 41.2 16.4 12.4 6.16
Oat Straw 12.4 4 24.8 2.76
Potatoes 6.4 2.4 9.2 1.28
Sugar Beets 4.4 2. 9.6 1.04
Timothy Hay 25.8 10.6 18 4.26
Wheat 47.2 15.8 10. 6.75
Wheat Bran 53.4 57.8 32.2 10.17
Wheat Flour 37.8 4.4 3. 4.85
Wheat Straw 11.8 2.4 10.2 1.97

GOOD ROADS—ROAD IMPROVEMENT.

F. F. ROGERS, PORT HURON, MICH.

The materials of which the roads are to be built in any farming community must for the most part be the materials close at hand, common earth, sand, clay, gravel and such judicious combinations of these materials as experience has taught to be best.

No matter how the road is to be finished or what material it is made of, there are three requirements alike common and necessary for all kinds of roads. They are—first, location; second, grade, including cross-section or shape; third, drainage.

LOCATION.

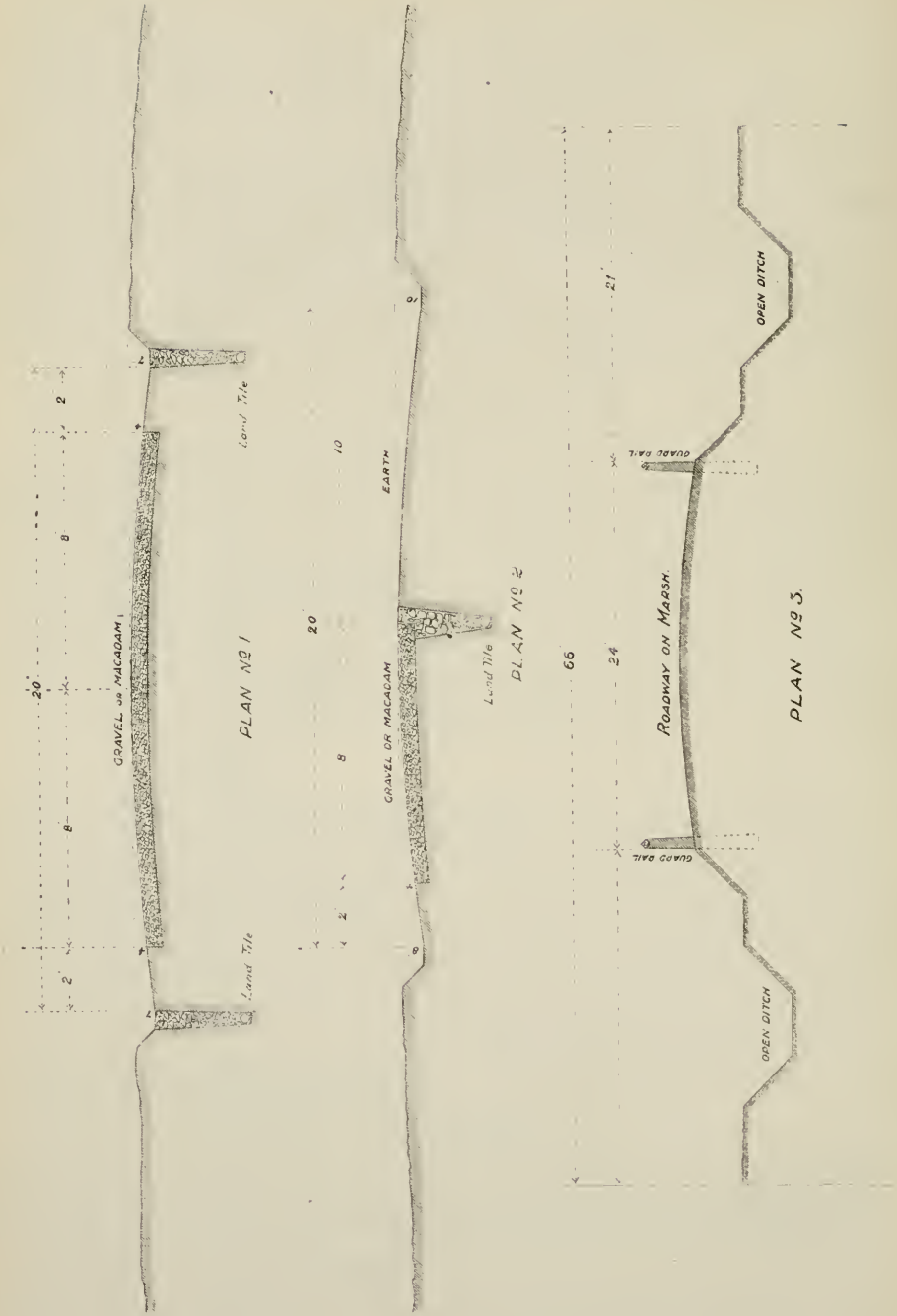
As to the location we probably shall never have much leeway in this State, for it seems to be a law, as unchangeable as that of the "Medes and Persians," that we must follow the section line over the hills and through hollows and swamps at enormous expense to the public, even if thereby it is forever impossible to make the road respectably passable. Main roads should be located as directly as possible between objective points, with as much regard to easy grades as a railroad. It is often no farther around a hill than over it. A few dollars spent in purchasing right of way for a good road is usually more advantageous than as many hundred dollars spent in digging down hills and filling up hollows.

GRADE.

It is clearly understood by all that loads are always limited to those which one team can haul over the worst part of the road, unless there is some way to increase the motive power at that point. Grades very rapidly diminish the loads which can be drawn on a level road. Thus, if the road be in such condition that one horse can draw 2,000 pounds on a level, he can move but about half that amount up a hill that rises one foot in 25 and but about one-fourth that amount up a hill that rises one foot in ten. This will be more fully shown by the following table from Potter's "Good Roads," showing per cent of full load that can be drawn up various grades on four classes of roads:

Grades.	Earth.	Gravel.	Macadam.	Plank.
Level	1.00	1.00	1.00	1.00
3 feet to 100 feet	0.75	0.68	0.50	0.38
6 feet to 100 feet	0.60	0.52	0.32	0.23
9 feet to 100 feet	0.50	0.42	0.24	0.17
12 feet to 100 feet	0.43	0.35	0.19	0.13
15 feet to 100 feet	0.37	0.30	0.16	0.11

If the finished road is to be a first-class gravel or macadam road, all grades should, if possible, be reduced to one foot in 20. It is generally


PLAN No 1
GRAVEL OR MACADAM
Land Tile
Land Tile
20
8
2
2
PLAN No 2
EARTH
GRAVEL OR MACADAM
Land Tile
20
10
8
2
2
PLAN No 3.
OPEN DITCH
GUARD RAIL
ROADWAY ON MARSH.
GUARD RAIL
OPEN DITCH
66
24
21

well known that a horse can exert about twice his ordinary power for a short time, thus allowing him to haul about the same load over short hills having this rise, that he ordinarily draws over the more level portions of the road. No stretch of road should be entirely level. Good drainage demands that it have some longitudinal slope—preferably not less than six inches to the 100 feet. If road grades could be kept between six inches and four feet to 100 feet they would be ideal grades.

The form of cross section of the road must vary somewhat with the kind of road and with the topography of the country over which it passes. It should always be sufficiently rounded to quickly drain the water to the gutters or side ditches, but any excess of this amount is an injury. If the road is not more than 20 feet wide nine or ten inches crown is about right for earth, six or seven inches for gravel and five inches for macadam. Do not build the roads too wide. For the heaviest traveled country roads 24 feet is an abundance, while ordinarily sixteen to twenty feet is ample. Fifteen feet is plenty for two ordinary vehicles to pass, and when the space is increased to twenty feet it will meet any emergency. (See plans 1 and 2.)

Where the road is on any embankment over three feet high, a suitable guard rail should be built along the exposed sides; this is best when about three feet high and is easily built by setting posts eight feet apart, notched at the top so as to receive the lower half of a 4x4 scantling set edgewise in the notches. It is fastened to the post by bands of hoop iron placed over the scantling and nailed to the posts. (See plan 3.)

DRAINAGE.

No matter how well the foregoing principles are carried out, no road will be a success that is not provided with thorough drainage; it is almost always cheaper and much more satisfactory to drain a wet place in a road than to attempt to fill it up. The character and kind of drainage to be used will depend altogether upon the kind of soil and lay of the land traversed by the road. These will be treated more fully under different types of roads, but in general, it is safe to say that all roads must be provided with side ditches of sufficient capacity and slope to quickly remove all storm and soil water to the nearest natural outlet, which outlet must be so improved, if necessary, that it will immediately remove all water from the roadway. Ditches are of little value that do not provide for a free and uniform flow of water.

SAND ROADS.

Should the road be of sand and naturally drained, leave it almost flat, with side ditches very shallow, and having only slope enough to carry off storm water when the ground is frozen, so as to avoid pools in the surface of the road. Keep the travel as much as possible confined to one track with some kind of vegetation on the shoulders that will not be killed by the occasional turning out of vehicles. Plant shade trees and leave the natural ones, as well as the brush; in fact, do all you can to exclude the drying effects of the sun, as these roads are much better when kept moist. Sand roads can be temporarily improved in many ways. A coat of straw or sorghum crushings will afford some relief.

Sawdust, especially that produced by cutting shingles, has been used with excellent results when covered with two or three inches of sand to prevent fires. Ordinary sawdust mixed with planer shavings is good. A covering of clay five or six inches deep is a very decided help. The clay should be covered with two or three inches of sand. In some parts of Wisconsin goods roads have been made in sand by excavating trenches in the wheel tracks eighteen inches wide and ten inches deep, filling with clay and covering with two inches of sand. The writer has built some excellent roads over sand by first putting on three inches of clay well rolled, covered with three inches of gravel rolled into the clay. This has formed a very hard surface which is impervious to water.

CLAY ROADS.

All clay roads need thorough drainage to a depth of at least three feet. The side ditches can be well supplemented with tile drains, preferably on each side of the road bed, but one in the center can be made to serve a very useful purpose, especially if filled with gravel or broken stone to near the surface. The road should be kept sufficiently crowning to shed water quickly to the side ditches, but sods and turf should never be scraped to the center.

Clay roads can be greatly improved by sand or gravel top dressing. Cinders and coal ashes can also be used with good results. Well drained clay roads, if kept surfaced, will be fairly passable most of the year, but heavy teaming in wet weather will surely cut them. These ruts should be smoothed down as soon as the road is partially dry. A covering of marsh hay, straw, or small brush on the natural ground before the grade is thrown up will facilitate drainage for a few years, and thus improve the road.

MUCK ROADS.

Muck roads cannot be made to sustain a heavy traffic without some treatment; they should be well drained and covered with sand, clay and gravel, where these materials can be obtained. Corduroy or log roads should be a matter of last resort, and be built only when no kind of drainage is possible. A foundation of boards laid double on two lines of boards for stringers has been used with success in a very wet, undrained marsh. This raft of boards was first covered with marsh grass, then with earth and afterwards with broken stone. This road was in first class shape after twenty-five years of use. Such construction is not troubled by the rising up of logs to form bumps in the road as is invariably the case with the log filling.

GRAVEL ROADS.

By far the greater number of Michigan roads will necessarily be so called "Dirt Roads" for many years to come and when any metalling or hardening coat is applied, it must in most cases, consist of gravel. This State is quite generally covered with gravel deposits, though they are usually found in small areas. There are, however, many considerable areas of flat lands where gravel can only be obtained by hauling it a number of miles. In such cases the co-operation of railroads could

often be secured, and the gravel delivered at the crossing of the road to be improved. Railroads have frequently done this work at prices but little above actual cost.

In selecting gravel, don't use sand, and on the other hand, don't use cobble stones. The pebbles should not be much less than 1-8 of an inch, nor greater than one inch in diameter. Gravel in most cases would be better for screening to take out the sand as well as the large stones. Very coarse gravel can be made into excellent road material by running it through a crusher.

Material of satisfactory kind now being found, we turn to the road bed. This should be graded, giving due regard to all that has heretofore been said as to location, grades, shape and drainage. In shaping the sub-grades, allowance should be made for the gravel that is to form the finishing coat, so as to leave the finished surface at correct grade and of proper form. Before the gravel is applied the sub-grade should be thoroughly rolled with a four ton roller. The gravel then should be applied in layers not more than three or four inches deep. Thus if 12 inches of gravel is to be applied it should be put on in three layers; if but 6 inches, in two layers, and each layer compacted with a roller or allowed to remain till hardened by traffic before the following layer is applied. Gravel roads cannot be compacted by rolling to such an extent as broken stone, but a considerable rolling will put the gravel in much better shape for immediate travel and thus very much hasten its thorough consolidation.

If the road bed is from 20 to 24 feet wide the graveled area should comprise 16 feet in the center when a double track is required and but 8 feet when a single track only is desired, which track may be either in the center or to one side of the center, leaving the other side for an earth track. (See plans 1 and 2.)

MACADAM ROADS.

While it is true that the vast milage of our roads will ever be dirt roads and most of those that are improved must be gravel roads, yet there are many localities where the principal roads can be macadamized at a cost that will not be burdensome to the community. I refer to parts of the State that are located in the vicinity of quarries containing suitable rock for this purpose, and many other localities which are so thickly covered with field boulders or cobble stones that they have to be removed from the land before it can be successfully tilled. Parts of Bay, Huron, Saginaw and Tuscola counties are so located that stone from Bay Port quarries can be used at reasonable cost, while most of the counties bordering on the St. Clair river should be supplied with stone from Monroe and Trenton quarries at prices quite within their reach. Where railroad freights do not exceed 50 cents per cubic yard stone from some of these quarries would no doubt be the most economical material to use.

There has been a marked tendency of late years by manufacturers to produce portable rock crushers which can be purchased by one or more townships, or townships and villages where suitable boulders abound. The stone can thus be crushed near where it is to be used. This would no doubt reduce the cost of stone roads to a minimum, but, even with conditions thus favorable, it must not be imagined that good stone roads can be built without much care and considerable expense.

The work will consist in preparing the sub-grade and providing suitable drainage in the same manner as for gravel. The width of space to be macadamized should be 8 or 16 feet according as a single or double track is to be improved. Earth shoulders should be raised on each side of this space, after which the sub-grade must be thoroughly rolled with a roller weighing not less than 4 tons and preferably 5 or 6 tons. This rolling must continue till no more compacting is possible. If the road bed is composed of clay or loamy soil 5 or 6 inches of sand or gravel placed on the sub-grade before the stones are spread will add very much to the durability of the road. When the sub-grade is thoroughly rolled a layer of crushed stone not greater than 2½ inches in any dimension may be spread upon the prepared grade. If the finished macadam is to be six inches thick, this first layer of loose stone must be spread four inches thick, as it will consolidate by rolling to about three inches. As soon as the first layer is evenly spread the roller should be passed a number of times over the loose stones to thoroughly compact them. Then a binder course of stone screenings or bank gravel ¾ to one inch thick should be evenly spread over the stone and wet down with a horse sprinkler till the screenings are thoroughly saturated and partly washed into the voids of the stone. This can be more cheaply done in country practice by allowing a good rain to do the sprinkling, provided the work can be done when the weather is suitable. Ordinarily no harm will be done by postponing the rolling till the weather is favorable. The rolling should continue till no more compacting is possible. The road will ordinarily have to be passed over twelve or fifteen times with a five ton horse roller.

After the first course has thus been prepared the second or top layer can be put on in the same manner, using this time, rather more of the binding material. Enough should be used to somewhat more than fill the voids in the stone. This last course will need about one-third more rolling than the first. The immediate success of the road will largely depend on the thoroughness of the watering and rolling.

DISCUSSION.

Mr. Graham: Would you plow in the center of the highway to turnpike it?

F. F. Rogers: No. After the roadbed is once made hard, don't disturb it. Do not abuse the grader either by pulling sods and soft dirt up into the center of an otherwise hard road.

Geo. T. Powell: Would you not urge the use of wide tires?

F. F. Rogers: Most assuredly. I would go so far as to urge the passing of laws compelling the use of tires certainly four inches wide on all vehicles carrying loads.

Mr. ———: There would be little need of a roller if all farmers used wide tires. It is the narrow tires that destroy the roads.

Q. Would you recommend the use of wide flat stone at the bottom of gravel roads?

F. F. Rogers: Usually not, but if the ground was very soft, I might do so.

Q. By what method can we induce a town board to go into systematic road construction?

F. F. Rogers: I do not know.

Mr. ———: We raise enough money to make good roads, but we spoil them both by our method of building and our method of use.

Q. What width of tire do you insist on?

F. F. Rogers: From three and one-quarter inches up.

Q. Is crude petroleum good for road building?

F. F. Rogers: I have heard of good success with it, but it is too expensive for general introduction.

GOOD ROADS: AN EXPERIENCE WITH THE COUNTY ROAD SYSTEM.

A. E. PALMER, KALKASKA, MICH.

Kalkaska county was one of the first to adopt this system of road improvement, four years ago. By the earnest work of some few of our enterprising citizens, the Board of Supervisors were induced to submit the proposition "to adopt the county system of road improvement" to the voters of the county. At the election the people adopted it with a bare majority of seven votes. Later three county commissioners were elected and by them a main trunk line, with a few lateral branches, was agreed upon for future improvement—this line extending across the county was adopted with a view of reaching the several market towns and railroads from the more thickly populated agricultural sections of the county by the most direct and most feasable and easily traveled routes, taking up the lines of township roads where it could be done to advantage and laying out new routes where it was necessary to avoid heavy grades that could not be reduced with a reasonable expenditure of money. At all times having in view the prospective cost of future maintenance of such roads as well as the first expense of building the same. This was not done without a considerable criticism and many suggestions for changes, which might be of benefit to individual interests.

The commissioners, however, in due time completed their work disinterestedly and with no object in view except the benefit to the whole county, losing sight of township boundaries and refusing to adopt the very prevalent idea "that the principal use of section lines is to lay out highways upon."

Recognizing that

THE SUCCESS OF THE COUNTY SYSTEM

depended very largely upon a practical illustration of what could be done out of the materials most convenient in constructing a permanent road where the people could judge of its value by comparison, and realize its benefits by actual use, the commissioners selected as their first object lesson a piece of swamp road, near the village of Kalkaska, than which there certainly was no worse within the county, and upon which the township had, with annual appropriations during the last twenty-five years, expended upwards of $10,000 upon the first mile, and still this piece of road, over which more travel was obliged to come, than on any other road leading to the village, was at some seasons of the year almost impassable. This piece of road where the muck varied from two to ten feet in depth was covered with an accumulation of many years application of logs, flattened timber, planks, saw dust, cedar bark, and sand, most of which had to be removed. A well graded turnpike with liberal side ditches, cross drains and center tile drain, with a covering of eight (8) inches of sand, was prepared and upon this was constructed a crushed stone road, 16 feet in width, 10 inches in depth, at a total cost for all the labor and material of $2,760.

The repairs upon this mile of road have been less than $10.00 per annum since it was built, and from present appearances bids fair to demand but a minimum expense for years to come. Upon completion of this road

OPPOSITION TO THE COUNTY SYSTEM WEAKENED

and has been steadily growing less ever since. With an average county tax of $5,000 per year the county has built up to this time nearly nine (9) miles of stone and about three miles of gravel roads, besides having some considerable length of road under partial improvement and being the owner of a stone crusher, roller, engine and other necessary road machinery, all paid for.

The county system in Kalkaska county has been exceedingly satisfactory. With our people it is not now the question, do we want to continue the system, but rather how can we more rapidly extend its improvements. To this end the townships are aiding by doing most of the necessary grading, leaving the county to make permanent by suitable covering. Very many of the most active opponents of the system at its adoption are now its most earnest advocates. The farmers have come to realize that the "mud tax" is far in excess of all other taxes combined. They now recognize that the greatest obstacle in the way of good roads is the general ignorance of how to make them, and universally acknowledge that it is

NOT A QUESTION OF MORE MONEY

expended upon our highways, but rather to stop wasting that which we are using—not higher taxes, but a wiser expenditure of these taxes.

That efficient machinery is just as profitable upon the roads as upon the farm.

That the object lesson of a good permanent road in the county does very materially assist every township in improving its highways.

That permanency in road building is not only desirable but economical.

That under the county system the cities and villages share with the farmer the burden of road building.

That county commissioners should be selected for their special fitness, honesty and general intelligence.

That it is the height of wisdom to pay as you go and never go into debt for road construction.

That the county system should eventually include all the roads in which there is a dominant community interest—then, if by a change in our highway laws, the town could be made a unit and its tax payable in money to its highway commissioner—it could with the assistance of county expert road builders and with an example furnished easily superintend and improve those lesser roads bearing a light local trafic. Divorce the whole business from local politics.

DISCUSSION.

P. Voorheis: What did your engine cost?

A. E. Palmer: $250.00. We bought also a Weston crusher for $1,300.00, also a four-ton road roller.

Q. Do you tile roads on the sides?

A. E. Palmer: Yes, when open ditches are not practicable.
Q. What is the cost per yard to crush the rocks?
A. E. Palmer: 22½ cents.
Q. Do you have to buy hard heads?
A. E. Palmer: Yes, we buy them near the place where the road is to be built. They cost us from $3.00 to $5.00 per cord, an average of $4.50. It costs 25 cents per cord delivered on the wagon ready for spreading on the road for crushing.
Q. What effect does winter have on the completed road?
A. E. Palmer: Frost doesn't affect it, if well drained.
Q. Do you crush coarse graved for the bottom of the road as well as the top?
A. E. Palmer: Very coarse at the bottom and finer toward the top of the road.

WEDNESDAY EVENING.

J. W. Hutchins, presiding.

THE POSSIBILITIES OF FARM LIFE.

J. T. DANIELLS, UNION HOME, CLINTON COUNTY.

Every one ought to have among his possessions that of which he is justly proud. I am proud of the fact that I am a farmer—that I am a member of one of the grandest of the "professions," that of the farmer—and I am fully possessed with the belief that nowhere on this round earth and in no walk of life are there any better opportunities for the building up of a true manhood and of a true womanhood than are found within the reach of the average American farm-home.

But what constitutes the "ideal" manhood and the "ideal" womanhood to which we would, in our better moments, respectively attain? For I believe that each one, at his best, really and truly desires to be all that God purposed that he should be when He gave him existence, endowed him with immortality and placed him in this "preparatory state;" and if we ever reach that high estate designed for us it will be through the use—right use—of means, and in no other way. Life is, truly, a great school, and as we reach the years of discretion, and most of us do, sooner or later, we naturally ask ourselves what should be

THE MAIN OBJECT OF OUR EXISTENCE?

And this brings to us, right here, the opportune question: What are the possibilities within the environments of the average farm-life, for the attainment of life's true object?

Are not our lives quadrilateral with mental, moral, social and physical sides and though very unequal may be the side and very "angular" some of its angles; yet the general form is thus. Is it not, alone, through right use of time, talents, opportunities and material things, that our highest possibilities are to be reached?

A lawyer friend, with whom I was conversing, said to me, "The average farmer has, or may have, at his command, more leisure than have those engaged in other callings." Doubtless some, perhaps many, of those present will feel inclined to dispute the correctness of such assertion, but I am certain there is much of truth in it. It is, most surely, not the lack

of time which prevents us from doing all that we should do, but the difficulty lies in the lack of knowledge of the right use of time, and in its use so that very best results possible shall be reached; what difficult problems are we required to solve.

Without question, a good system, properly applied, will be of great service here. Nature in all of her works teaches us the value and the benefits of system. The man who accomplishes the least is he who works without system, and, of course, he's also the most hurried of men, flying around within a peck-measure and having no time to even look over the sides and of course, he has no time to attend an institute—so he's not present—but some of his relatives—near relatives—perhaps, are here, and they can lend these suggestions to him, but be sure to have them returned, so that you may have their benefits also. (It's good to be "neighborly," but one ought not to "lend" that which he may most need himself.)

In the home, upon the farm, in winter time, the hours that may be passed

"AROUND THE EVENING LAMP"

gleaning from good books, the best thoughts of the best minds, of all the ages: this is one of the "possibilities" of the farm-home. Have we used it? Do we use it? Shall we use it and to its highest limit?

In my childhood's home, and in my home of later years; one of the brightest pictures thereof which hangs on memory's walls, is that of the hours passed "around the evening lamp." Though the "evening lamp" of my childhood's home was the regular domestic tallow candle, with its mellow—very mellow—light, and the amount of "snuffing" it would endure was one of the "possibilities" of my earliest recollection; but petroleum and electricity have given the final "snuff-out" to the "tallow dip."

But of our reading during these leisure winter evening hours—

WHAT SHALL BE ITS CHARACTER?

I would not advise the fullest reading of the daily press, which, it seems to me, has, in many instances, increased in quantity, but at the expense of quality, and mingled with the grain much of chaff and harmful seeds. There are notable exceptions, but such appears the general condition. But of "good books" the supply is ample, if one but chooses wisely and properly. Classed among these are the works of Charles Dickens, Miss Muloch's "John Halifax," George Eliot's "Adam Bede," Miss Holly's "Sweet Cicily." In truth the supply is almost limitless. As a flower imparts its beauties and its blessings, yet without diminution, so doth a good book.

Of talents, who is there to assert that he has used, to the utmost, those entrusted to him? And right upon the farm and in the farm-home is abundant opportunity for use of highest and best talent. The farm is, truly, a great laboratory, wherein we may broaden our powers of observation and research and develop ability to trace from cause to effect; and don't fear that you'll get too high up in your calling as a farmer. Be willing to venture somewhat, as was the man who said, "I don't care how high up I get, just so that I keep one foot on the ground."

And now, what of the opportunities which come to us upon the farm

and in the farm-home? I am sorry that we must accept as true the statement, "Wasted opportunities are responsible for many dismal failures in life." Oh, the wonderful opportunities for growth and advancement in these days. As I stood upon the Centennial grounds at Philadelphia in 1876 endeavoring to comprehend, to some extent at least, my surroundings, having just held a conversation with an aged Marylander—John Scotti, by name—who, seated in front of the Maryland state building, had related to me how, as an engineer on the Baltimore & Ohio railway, one of the first built upon this continent, his train had drawn and distributed the material for Professor Morse's first telegraph; and also having read, upon those grounds, this notice to the public, "Telegrams sent to any part of the world"—under the oceans and over the mountains, would the messages be carried, and such progress made in this direction, and all within the bounds of the matured years of one man's life-time—John Scotti had seen it all—and I asked of myself this question, "Is it possible for the succeeding century to show as great progress in the development of the arts and sciences and material things as is shown by the century now closing?" And I could give but this one answer to my question, "No, it is not possible."

But a visit to the great Columbian exposition of '93—less than a quarter of a century having passed—convinced me that a wrong answer had been given to my question of '76, and that the century succeeding America's Centennial will show equal, if not greater, advancement and profitable growth than was shown by the century preceding it. And we

FARMERS MAY HAVE A GENEROUS SHARE

of this growth, which is taking place, during these bright, closing days of the brightest of the centuries. If we fail to secure this, 'tis but a "Wasted Opportunity."

There is another line of benefits which come, because of farm-life. It is the benefits of farmers' organizations. The oldest of these, the Grange, has, for more than a quarter of a century, been doing its good work along lines of usefulness and helpfulness. Another one is the Farmers' Club, and though of more recent origin, it also is doing grand work for the farmer and especially for the farm-home.

The institute also finds its proper place and work, and the trio offer opportunities which every farm-home should find or make possible to enjoy.

Every properly desirable object has its "price-mark," and may become ours; provided that we are willing to pay the price and, as a general rule, we prize most that which costs us most. Are we willing to pay the price and thereby come into possession of all good which lies within the range of the possibilities of farm-life?

There is one principal feature of this subject that I would impress, especially upon your minds. It is that of the importance of seeking to

MAKE THE HOME HOME-LIKE.

When riding through the country occasionally a habitation is seen, which resembles a "block-house" in so far as any adornment is concerned, and evidently a dreary place in winter and a comfortless place in the heat of summer, and from such a place one cannot wonder that the children are

glad to get away. On the other hand, homes are passed which are beautiful, not alone physically beautiful, but beautiful in their influences.

The beneficial and ennobling influences which emanate from a true home are worthy of our best efforts; for it is within the home and during the years of childhood that a trend is given to character which the care and toil and trial of later years can never wholly efface. Whatever else may be neglected, don't fail of making the home "home-like." A place where one may but work, eat and sleep is not a "home."

I am impressed with the belief that the strength of our nation lies not in its army and its navy—though justly proud we are of their recent brilliant achievements—neither is its strength found in its wealth nor in its wisdom, but within its loyal, Christian homes is found the principal source of our nation's real strength. And those homes are very largely farm-homes, dotting thickly the landscape all over this fair land.

Let us strive, then, to make our home such that it may contribute its share to our nation's strength; to our country's highest good, and that it may give to its inmates the rich blessings of a loyal, Christian home.

But it is to the wife and mother that the home is indebted for that which is beyond price and ready computation. To her the duty is allotted of providing those innumerable little comforts and conveniences of the home—little?—yet all important because of their influence and bearing upon the real happiness of its inmates. Her refining influence endows with blessings the home, such as words cannot express.

Then make the home such that memories of it will come to bless the gray-haired child of later years, causing the joyous exclamation, "It was the dearest place on earth to me, my childhood's happy home."

Make home such, that from it sacred precincts shall go forth grand men and noble women—Christian men and Christian women—to do valiant service in life's battles. This is the possibility of farm-life. This is the sacred duty of the farmer-home.

RURAL EMBELLISHMENT.

W. W. TRACY, DETROIT.

Among all the elements of life there is none with more potentiality of happiness than the sense of beauty. This is proved by the fact that ever since the edict went forth that man should live by the sweat of his brow a large proportion of human labor over and above that which is necessary to supply man's mere physical wants of food and shelter has been expended to in some way please the eye. This is not an over-dressed audience, it is not a particularly ornate room, but a large share of the labor, the results of which are before you at this moment, could have been saved had we utterly disregarded appearances.

To go farther, look out into the world in which we live, and we would find that from the blade of grass, or the flake of snow, to the stars above our head, some part, and often a large proportion, of the thought, of the labor, of the power used to create them was expended for the sake of beauty. Would not this be a dreary world if every plant and tree were clothed with leaves exactly alike? I fancy a single glance at such a world would convince the most practical man that beauty has a large

place in God's life and work, and a larger one in his own than he had thought.

THE ENJOYMENT OF BEAUTY.

Ruskin says that every human conception of beauty has its origin and finds its most perfect expression in some thought of the Creator expressed in material things. This ability, through our sense of beauty, to enter into the thought of God is surely no mean source of the happiness, the pursuit of which is one of the inalienable rights which our fathers declared was the birthright of every human being, and which is as truly a part of the gift of life that comes to a child as any other power; and to rob him of it, or allow it to perish through lack of use, is a crime as monstrous as to rob him of his liberty, or of his mind, or of any other gift of God.

It is an inexorable law that to him that hath shall be given and from him that hath not shall be taken even that he hath, and use is essential to the continuance and growth of every power or right. And, my friends, I honestly believe that there are many children in this State, yes, in this town, who are being wronged through the neglect of the development of their sense of beauty. It will not do to say that your child never seemed to care for such things. Have you ever done anything to develop this sense and power? If we give as little thought to, and as seldom exercise any other power of mind and body as we do this ability to see and feel the beauty which is everywhere about us, would it not become weak, and finally die?

WE OWN ALL BEAUTIFUL THINGS.

The beauty of everything which God has made belongs to every one of His children to just the degree to which they can appreciate and enjoy it, and it cannot be passed on by title deed. A Vanderbilt may build and shut me away from the beauty of a Biltmore, but he cannot thereby possess himself of the enjoyment of the beautiful which he takes from me. The grace and beauty of yonder elm, like the beauty of the blue sky above, may be just as much mine as the man's who holds the title to the land on which it grows. It belongs in the greatest measure to the one who enjoys it most. The beauty of the lily which I see growing in my neighbor's yard is just as much mine as is that of the one growing in my own.

We all have a sense of ownership in, and responsibility for, the glory of our nation, and take pleasure in its might and power. In precisely the same way we ought to be willing to give something of our personal comfort and labor to the preserving and adding to the beauty of the country, particularly to its roadsides and other places which are acknowledged public property, for its beauty belongs to all as much as its liberty and glory. It increases any man's love for his country to fight for it. The more he gives and does for her, the more dear she is to him and the more joy he gets from her glory. There is nothing which will do more to make patriotic citizens of our boys and girls, to increase their love of country, than to induce them to give something of care and labor to make their town beautiful. Every tree set and cared for by a boy binds him to the place with cords that become stronger with its growth. What

I plead for is not only that we should strive to develop the sense of beauty in our children and in ourselves, but we should think of it as we do of liberty, as a universal heritage which becomes more and more precious as it becomes universal and which we should strive to hand down to those who come after us in increased measure.

AS TO PRACTICAL SUGGESTIONS

to accomplish this: It is far more difficult to speak wisely than to urge its importance. A definite plan for the treatment of roadsides carried out in the same way all over the State would be very unsatisfactory, for our enjoyment of the beautiful comes largely from its evidence of design and loving, thoughtful care, and without these the most perfect form and richest color give little pleasure. The enjoyment and good which we get from beautiful things is measured largely by the degree to which we or some one put heart and life into them. A clump of elms or a single one saved from the forest is far more beautiful to me than a formal row of soft maples, but if the latter seem beautiful to you, set them and I shall enjoy them because of the love which prompted you to plant them.

AN INSTANCE.

Some sixty years ago a teacher in a country district school, in a little town in Vermont, interested her pupils in setting some trees and shrubs in the schoolyard, continuing her efforts from year to year until the children became enthusiastic in their work, and not only beautified the yard, but took into their loving care the roadside and a bit of waste land in front of the schoolhouse, and between the road and a babbling brook which ran parallel with it, and made the place one of the most beautiful I ever saw. Some twenty years ago a native of an adjoining town who had made an immense fortune in the west was looking for a place to build a summer home, and was so charmed by the beauty which had been developed by the work of those school children that he was led to locate where his house would overlook it, and he has spent over one hundred thousand dollars on the estate, and through his influence others came, so that the result of that teacher's work was the determining cause of adding nearly a quarter of a million dollars to the tax roll of that town. But the financial gain of such work is a trifle compared to the good which comes to those who do it. I believe that every boy who climbed down in that ravine was a better boy and a more loyal citizen of that town because of what he did that day. I believe that many a boy and girl went from that Vermont school yard to make their own homes more beautiful.

LET ME TURN FROM WHAT I THINK TO WHAT I KNOW.

Some forty years ago a school boy in a Massachusetts town sat one evening on a ledge of rocks in a pasture, from which a beautiful sunset view of the western hills could be obtained. As he sat there it occurred to him that the scene would be more beautiful if there were some trees and shrubs to partially hide another ledge some distance down the hill. The following day the boy ran away from school, accepting with complacency the consequences thereof, and set out a dozen or more trees and shrubs from a neighboring wood, where he thought they would be most

beautiful. Afterwards he set out other trees by the roadside and in pasture fields, and established plantations of flowers. For the few years he remained there he derived the keenest pleasure of his life from those colonies of native plants. Then he left the town and did not return for twenty-five years, and when he did he visited his sunset rock and found that the trees he set had grown to be forty feet high and helped to make a wonderfully beautiful landscape. The place was noted for its beauty, and thousands have sat where he sat that spring evening twenty-five years ago and admired and were helped by its beauty, but to none of them was it so precious as to him, for it was his by title far stronger than a warranty deed. I know that that man feels that there is not a single day's work he has ever done which paid so well as that done that spring day, as a truant boy. I know, too, that any such work which you may do with a pure motive of making your street, your town, your State more beautiful will give you large returns in pleasure.

WHAT CAN YOU DO?

I had hoped that our Agricultural College, in connection with the State Horticultural Society, would this spring start the work of inducing the formation all over our State, of village and neighborhood improvement associations or clubs through which such efforts might be united, wisely directed, and made more efficient. This does not seem likely to be accomplished. But don't wait for it. Every man, woman and child can do something now toward making our State more as God would have it. It may be that you can start such an association in your town or school district. It is possible that all you can do is to put out of sight the old wash boiler that lies by the roadside and which you have passed at least a thousand times. But do that and then do the next thing, and keep doing and you will find that it pays.

My friends, talk is cheap, but I assure you I believe in and feel the truth of what I have said, and if I have increased in the least, even in a single heart, the interest in and love for the beauty of the home which our common Father has made and given us I have not talked in vain.

THURSDAY FORENOON.

A. E. Palmer, presiding.

QUESTION BOX.

Q. Will some one from the Saginaw valley give his experience with the Handy wagon?

J. W. Morrice, Monroe Co.: I bought a set of low down wheels in 1891. I am using them yet and would not do without them. The wheels are 36 inches in diameter.

N. E. York, Tuscola Co.: I use three of these wagons and recommend them for general use on the farm. I would make the wheels wholly of metal, with long hubs.

I. N. Cowdrey: What about the waste of manure from the house closet? Can it be easily and cheaply conserved?

Geo. T. Powell: This is a matter that interests every family. In the country home there can seldom be any system of water works and hence no water closets. My suggestion would be to place, as a substitute, in the outhouse, galvanized pails

which can be emptied weekly and the product utilized. There will be no offensive odors if plenty of dry earth is used, and as no horse is needed the receptacles will be emptied at the proper times. Coal ashes make a good absorbent for this purpose.

Q. If buggies must continue to be equipped with narrow tires, why not tax them and thus get funds to repair the damages they cause?

A. E. Palmer: I think the present road law covers the ground.

F. F. Rogers: The present law in some states allows a rebate on road taxes in case of farmers using wide tires on their wagons. New Jersey allows a rebate of $1 per wheel if tires are four inches or more wide.

Geo. Houghton: Would any county commissioner take more interest in our roads than the farmers themselves?

A. E. Palmer: The best way to answer that question is to suggest that a farmer be elected commissioner. Get a man with some public spirit, a man that will use common sense, and a man in whose honesty and good judgment people have confidence.

Q. Would Mr. Hinds cut or plow under his surplus clover?

H. H. Hinds: I would do both—cut it and plow it under. It loses nothing of fertilizing value by drying.

Q. Do you consider giant beggar weed better than clover in any way?

C. D. Smith: In no way.

Q. Does not the average of the corn left shocked in the field lose from 20 to 50 per cent of its feeding value from mice, rats and weather?

H. H. Hinds: No, sir! If you shock in large shocks the loss from weather is insignificant. Leave it in big shocks and it will not spoil appreciably. I can't say as to rats and mice. A harvesting machine is a good thing. I use a steel cutter and a contrivance for hauling the corn tight together in the top of the shock before tying.

Q. Would not subsoiling benefit corn crops as much as sugar beets?

C. D. Smith: Our experiments do not show as much benefit from subsoiling as we expected.

Q. What is meant by the term "flax-meal?"

C. D. Smith: Feeders use the term flax-meal to designate ground flax, the oil left in it.

N. P. Hall, Ingham Co.: Will not red clover, with its long tap root, gather more nitrogen from subsoil than the crimson variety?

Geo. T. Powell: Yes, largely because it stands two years. It draws mineral matters from deep in the soil. The nitrogen comes from the air and not from deep in the ground, and hence the crimson clover with its fibrous roots may be equally as efficient in storing it up.

W. Schlieter, Sanilac County: Do you feed clover dry to your hogs?

C. D. Smith: No. Clover for winter feed of brood sows should be run through a cutting box, moistened and mixed with grain feed.

J. W. Adams: How do you sow crimson clover in corn, by drill or by hand?

Geo. T. Powell: By hand, taking three spaces at a time. You may sow from the back of a horse with good success.

Q. Describe alsike clover.

C. D. Smith: The blossom of alsike clover differs from that of any other variety in being white and pink in color—white in the center of the blossom and pinker near the margins. The clover is not as upright as the other varieties, perhaps, but is easily distinguished when once recognized.

Q. Which do you like best, straight or slanting landslide, and why?

Geo. T. Powell: I like the mold board to be abrupt, not too straight, leaving the furrows unbroken but simply turned over.

A. B. Cook: I object to a slanting landslide, even if the plow does draw easier, because it leaves part of the ground unturned.

Q. How much should a good calf weigh at a year old, fed on skim milk, grain and hay?

H. H. Hinds: If of the "growthy" breeds he should weigh 750 to 1,000 pounds, possibly 850 pounds as an average.

J. H. McColter: Is it a universal rule that the hard plow to hold does better work?

Geo. T. Powell: We have not studied the matter as closely as we ought. Everything depends on the way it leaves the furrow. If this is broken and ground up, the plow is doing good work. If it lies down smooth and straight, the plow fails of its full duty. Many modern plows have sacrificed efficiency to ease of draft.

THE DAIRY.

HOW TO CHOOSE A GOOD DAIRY COW.

PROF. C. D. SMITH, AGRICULTURAL COLLEGE.

That cow is a good one that transforms a large amount of feed into milk and butter economically. A farmer has hay, silage and grain that he does not want to sell as such. He wants to put them through the body of the cow and by her machinery separate the financially valuable butter from the fertilizing elements to be returned to the soil. The question to be discussed is how to choose the machine that will make this separation most efficiently and economically.

Unfortunately dairymen without the scales and test do not appreciate how widely cows differ from each other either in gross returns for the year's campaign or in the amount of milk and butter they produce from a given amount of feed. In a grade herd recently purchased for the College we have, for instance, two cows costing approximately the same, one giving four hundred pounds of butter per year and the other but little over two hundred. Do these cows look alike?

IS THERE ANY OUTWARD SIGN

by which the dairyman can select his good from his poor cows? I wish the signs were more easily seen. In looking over this grade herd, knowing the records of each cow, it is plain to note that the good cows are by no means the handsome ones, nor are they universally the homely ones. We have cows, giving 350 pounds of butter, with long, slim, dishing heads, and others with heavy, thickset stupid ones; good cows with long slim necks and others with short, apoplectic necks; good cows with bare "skinny" shoulders and equally good ones with shoulders well covered. Are there then no characteristic points that a good cow has and that are absent in a poor one? The answer must be—none that are apparent at first glace to the beginner in cow selection. It is an art to pick out good cows; an art to be learned in the school of experience.

Naturally in choosing a good cow the udder and the blood vessels leading to and from it receive a good deal of attention. The udder, as far as utility is concerned, may be even or uneven, hung well up or pendent, fleshy or milking away to almost mere empty skin, and yet the cow be a profitable animal; but the udder must be well developed with reasonably prominent milk veins and fairly large "milk wells" if you are to expect large yields from her. Next

THE COW MUST SHOW IMMENSE DIGESTIVE CAPACITY

by the loose hide, big belly, wide mouth and comparatively heavy jaw. Good health and good digestion are prerequisites to economical milk production.

Next, the cow, even if she be a so-called dual purpose animal, must indicate a generous disposition, a tendency to put her food in the pail

rather than on her back, by the thinness of the ham and the prominent lean spine.

No matter how thoroughly versed in "signs" a man may be, he will not know to a certainty until he has taken her home and tried her, whether he has a good cow or not.

If time permitted it would pay to weigh and test the milk for two or three milkings at least, though but little dependence could be placed on the results of a short test as an indication of the staying qualities of the cow.

The best even an expert dairyman can do is to judge how nearly the animal offered to him comes to the mental picture he has of an ideal dairy cow, and if she conforms thereto buy her and take the consequences.

FEEDING AND CARE OF A SMALL DAIRY HERD.

COLON C. LILLIE, COOPERSVILLE, OTTAWA COUNTY.

The feeding and care of a herd of dairy cows are of much more importance than the average dairyman seems to appreciate. The common, much abused, "scrub" cow if properly fed and cared for will usually give profitable results. Indeed with a little care in their selection one can pick up a herd of common cows that will bring good returns for food and labor bestowed upon them.

These statements are warranted by two recent experiments, one at Kansas Experiment Station and one at our own Michigan Station. In both instances common cows, 20 in number, were selected and purchased —in Michigan by Prof. C. D. Smith himself, but in Kansas by a farmer who was not a dairyman. Both herds were in quality below the average cows of the states. The average cost of the Michigan cows was $39.00; of the Kansas, $34.00. Both herds were fed and cared for according to modern ideas of dairying. Both made good profits. The Kansas herd produced on the average 5,707 pounds of milk, testing 4.17 per cent; which equals 238.1 pounds of butter fat, that sold for $37.75 at the average price of 15.9 cents per pound, the price paid at Manhattan Creamery for 1898. Each cow was credited with her skim milk at 15 cents per 100 pounds, or $7.69, making a total of $45.44 per cow. The average cost of feed was $29.20. This would leave an average net profit of $16.25. The best cow made a profit of $40.37, while the poorest showed a loss of $0.43. The cost of feed per 100 pounds charged to the cows was: Corn meal, 55c; Kaffir corn meal. 55c; oil meal, $1.25; soy bean meal, $1.00; cottonseed meal, $1.00; bran, 55c; Alfalfa, $4.00 per ton; ensilage, $1.00 per ton; pasture, 75c per month.*

Records were collected from 82 herds owned by creamery patrons in one of the leading dairy sections of Kansas, which showed that the average yield of milk per cow was 3,441 pounds, butter fat 104.5 pounds, value of butter fat, $19.79. Now, the value of butter fat from the College herd, figured at same price, was $37.75.

WHAT CAUSED THIS GREAT DIFFERENCE IN VALUE OF RETURNS?

Scientific, if you please, or common sense feeding and care. Hence we say the feeding and care of the dairy herd is of great importance.

*For result of Michigan herd, see Station Bulletin No. 166.

The two principal bulky foods grown on the farm for the dairy herd should be corn silage and clover hay. Why? Because:

1. There is no plant adapted to the climate and soil of Michigan that will produce so many pounds of cow food per acre as the corn plant. The most economical way to preserve this plant is in a good silo. Many experiments prove that under the best conditions there is a loss of only 8 per cent in food value when it is made into ensilage, while dry cured corn fodder loses as ordinarily handled 50 per cent, and under the most favorable conditions about 25 per cent or 17 per cent more than when ensiloed. Now 17 per cent of the value of the corn plant is well worth considering. Again, silage, owing to its succulence, is much more palatable than dry fodder. Besides, it costs no more to put the plant into the silo than to harvest it in any other way.

2. The clover plant should be

PRODUCED ON EVERY FARM IN MICHIGAN.

It gathers nitrogen from the air; it pumps up phosphoric acid and potash from the sub-soil, and it improves the mechanical conditions of heavy soils by reason of the penetrating power of its roots. But besides this, the dairyman wants clover hay to feed along with corn silage. Corn silage contains only a trifle over 1 per cent protein, while clover hay contains nearly 3 per cent. The dairyman should therefore strive to grow large crops of corn and clover.

THE NECESSARY RATION.

Both scientific experiments and practical experience prove conclusively that a dairy cow should have about 2 to 2.5 pounds of protein, 12 to 15 pounds carbohydrates, and 0.5 to 0.8 pound of fat per day. How can we possibly get this proportion of these food elements from these home grown feeds? There is not enough protein in proportion to the carbohydrates and fat. And the farmer must if he want to feed economically, and profitably, buy some concentrated food rich in protein. He has a choice of wheat bran, gluten feed, oil meal, and cottonseed meal, and he can well afford to let the price of a pound of protein in these different foods determine which he shall buy. If he can buy that pound of protein cheaper in wheat bran, then buy wheat bran; but if he can buy a pound of protein cheaper in oil meal or cottonseed meal, then buy these foods to feed with the corn silage and clover hay.

OUR PRESENT RATION.

At present we are feeding 40 pounds of corn silage; 10 pounds of clover hay; 3 pounds of wheat bran; 2 pounds of gluten feed, and 2 pounds of oil meal. There is no objection to feeding straw, corn stalks or roots in connection with these foods, indeed they either one or all are beneficial because they furnish a variety.

Cows should never be fed more than they will eat up clean. If one leaves only a small portion of her food the ration should be cut down at once and then gradually increased. It is important that the cows should be fed regularly. It matters not so much at just what time night and morning as it does that they be fed every day at the same time.

CARE OF THE COWS.

There is one, and only one, way to care for cows, and that is to make them comfortable. It doesn't require a costly barn, but the barn must be warm, light, dry, clean and well ventilated. A cow is not comfortable when any one of these conditions is wanting. A cow should never be turned out of the barn when the weather is freezing, for she will not be comfortable. This is the rule on our farm. They stay in the stable day after day unless the weather gets warmer than freezing; when it does we let them out for exercise unless it rains or the wind blows severely. To adhere to this rule requires that we have some way of

WATERING IN THE STABLE.

If we are obliged to turn the cows out to drink, if only into the yard, then some days they must go out when they ought not to. We had some dear experience several years ago along this line. Two of our best cows were turned out to drink on a very cold day and were chilled. The result was a shrinkage of nearly one-half of the flow of milk and they never recovered. But we have later evidence. Only this winter. The water pipes froze up and before we could get them thawed out we were compelled to let the cows out to drink, with the result on one herd of 24 cows of a loss of 100 pounds of milk per day. This loss has never been fully recovered and never will be this season.

DISCUSSION.

A. M. Welch, Ionia: Too much stress cannot be laid upon having the water in the barn. The secret of success in cow keeping is to keep the animals comfortable. This is forgotten when a man drives his cows 30 or 40 rods to a spring to drink.

Q. At what temperature ought water to be for cows?

C. C. Lillie: Not real warm, but the chill taken off. Cows should be watered in a place where they will not shake and not be driven away from the barn with the thermometer 35 degrees below zero.

L. D. Watkins, Jackson Co.: I believe that there is more nonsense to the square inch in this silo business than in any other that we have heard discussed at this Institute. Some one is laboring under a mistake. I believe that corn, to be fed most economically, considering the labor involved and all, must be fed from the shock. The best feeders in the State, like F. Hart Smith of Hillsdale county, have fed that way successfully, and I have followed their example. I have fed steers for almost sixty years, feeding shock corn too, and have fed successfully, making money out of the business.

F. W. Dunham: It is not possible for everyone to have water in the barn. My method is to turn out two at a time when the weather is cold, let them drink and come in, and then turn out two more.

Mr. Campbell: Why not use caustic potash on the heads of young calves and stop the growth of the horns? It is then much less trouble to care for them, to water and feed them.

GILT EDGE BUTTER AT HOME.

G. H. TRUE, AGRICULTURAL COLLEGE.

With reference to the manufacture of butter on the farm, butter makers should ask themselves the questions: Can we, from the same milk, make as much butter as would be made at a creamery? Can we make butter

as good as creamery butter? And, provided we do, can we find sale for it at the highest market price? To these questions should be added the brief but pointed one. And if not, why not?

My reply to the first question would be, "That depends." If you depend upon the shallow pan method of raising cream

YOU CANNOT AVOID A LOSS

of butter fat much greater than under creamery conditions. In our own work, with conditions more favorable than those usually obtaining upon the farm, our loss of butter fat in the skim milk has been nearly seven-tenths of a pound for every hundred pounds of milk, or about one-fifth of the total butter fat. The loss under usual farm conditions, as indicated by a test by us of some twenty-seven samples collected by us among farmers of Ingham county, is fully one pound of butter for every hundred pounds of milk or between one-third and one-fourth of the total butter fat. The argument for shallow pans is that they are inexpensive; but if it were generally known that they are used at an expense of at least one-fifth of the butter product of the herd they would not be considered so cheap. If cream is raised by

COLD DEEP SETTING,

ice must be used in order to get the best results. The colder the water in which the milk is set the more complete the separation. With the water at a temperature of 36 degrees we have been able to reduce the loss in the skim milk to one-fifth of a pound per hundred pounds of milk while the milk set at from 50 to 60 degrees contained over four-fifths of a pound of fat per hundred pounds of milk. With a herd of ten good cows

A HAND SEPARATOR

would prove a profitable investment. The loss of butter fat in the skim milk need never exceed one-fifth of a pound per hundred pounds of milk and should be less than half that amount.

With reference to the question relating to the quality of butter, I would answer unhesitatingly, "Yes, as good butter can be made at home as in a creamery." But the fact still remains that by far the greater part of the butter made on the farm is of such an inferior quality that it does not bring a price sufficient to pay for the food of the cow producing it.

If the kind of butter is to be made which finds sale at the highest market price, the utmost care must be taken in every detail of the work. Only wholesome food should be fed the cows, the milking should be done in a cleanly manner, and the milk carried from the barn as soon as possible after milking, and strained through a suitable cloth strainer. It should be set in a cool room where the atmosphere is pure, or better yet, in deep settings where ice is used.

MORE MISTAKES ARE MADE IN HANDLING CREAM

than in any other of the various operations connected with butter making. The condition of the cream as regards ripeness must be under con-

trol, if the flavor of the butter is to be under control. Cream from shallow pans, that is sour when it is skimmed, should not be held for more than a couple of days before churning, and then it should be kept as cool as possible until ready to churn. Where cream is gathered by means of the cold deep setting or the separator, it should be churned as often as twice a week. Unlike the sour cream from the shallow pans, this cream will need to be ripened. It should be kept sweet until enough for a churning is gathered and then warmed up to sixty or sixty-five degrees and allowed to stand at that temperature for about twenty-four hours or until it has developed a pleasant acid taste. This ripening of the cream is what gives the butter flavor. Cream should be churned at

AS LOW A TEMPERATURE AS POSSIBLE

and have the butter come in a reasonable length of time, say thirty minutes to an hour. This temperature will probably be found to be somewhere from 56 degrees to 60 degrees. Separator cream may be churned at as low as 52 degrees. The churn should be stopped when the butter is in a fine granular condition and floats well up out of the butter milk. Wash the butter once, or until the wash water is clear, by filling the churn half full of water at about the temperature of the butter, turning the churn once or twice and then drawing off the water.

Don't pack the butter together until the salt has been added in sufficient quantity to satisfy the taste of your customers—one ounce to the pound generally being about right. Once working may be sufficient in some cases, but it is safer to work twice. Work just enough the first to thoroughly incorporate the salt. The second working should be at least two or three hours after the first and just enough to insure freedom from mottles.

Always pack a print in neat form. If these directions are followed the third question will answer itself. Market can always be found for really fine butter at good prices, as those who are to follow me will tell you from their own experience.

DISCUSSION.

Mr. Bartlett: How can we tell whether our thermometers are correct or not?

G. H. True: By comparing with standard instruments. At first the freezing temperature was determined by putting the thermometer in melting ice, then the boiling point was found by immersing the thermometer in water boiling at a certain barometric pressure. The distance the mercury rose between these points was divided into 180 graduations or degrees.

Perry G. Towar: Will deep setting in ice water take out all the cream?

G. H. True: Yes, down to two-tenths of a per cent of fat in the skim milk when the cows are fresh. As the cows get along in the period of lactation it will not cream as thoroughly.

Mr. Bartlett: I have understood that the zero mark on the thermometer was found by mixing salt and snow and noting how low the thermometer would go in the mixture. Is that true?

G. H. True: No. The zero point was indeed at one time supposed to be as low as a thermometer would go, but now the definite point on the scale is fixed by the temperature of melting ice.

Mr. King: How many cows ought a man to have before it will pay him to own a separator?

G. H. True: I should say six or eight good cows.

Q. How about stopping the churn when the butter is fine? I have trouble in draining off the buttermilk.

G. H. True: Churn until the granules of butter float. The addition of a little brine will often aid in bringing the butter to the top, when the buttermilk may be drawn off from below.

Q. What kind of milking brings best results?

G. H. True: Milk fast and clean, but with gentleness.

Q. Is milk warm enough to set when it first comes from the barn?

G. H. True: Yes, as a general rule.

Q. Is there any law against coloring butter?

G. H. True: No.

Hon. Geo. B. Horton: Anything that affects the markets of the farmer's production is of vital consequence to all of us. In Chicago and elsewhere certain by-products of the slaughterhouses are manufactured and colored to resemble butter and put upon the market to take the place of butter. It is displacing butter wrongfully, because the ultimate consumer is seldom informed that he is offered a substitute when he calls for butter. Some law against this fraud must be enforced or the butter market is in serious danger by reason of this harmful competition of cheap and fraudulent material. A Massachusetts law prohibiting the coloring of oleomargarine to resemble butter has been held constitutional. In Michigan in 1897 a similar law was supposed to be passed by the Michigan legislature, but it lacked the enacting clause. We now want a re-enactment of this law.

Mr. Horton offered the following resolution:

Whereas, The State Round-up Farmers' Institute is an aggregation of representative men and women from all parts of the State, and as such is reasonably a representation of all the farmers on any question about which it may declare itself; therefore,

Resolved, That we ask of the present legislature the re-enactment of the anti-color law in such strengthened form as will favor its rigid enforcement.

Resolved, That all butter substitutes should be regulated by law to the end that deception and fraud shall be eliminated from their manufacture and sale.

The resolutions were unanimously adopted.

MARKETING THE PRODUCT OF THE HOME DAIRY.

MRS. ELLA E. ROCKWOOD, FLINT.

In marketing the product of the farm dairy so as to secure the greatest amount of profit, we should aim to dispense with the services of a middleman, and deal directly with the consumer. It is in this way that we get the extra price which the retailer demands of his customers.

Our own experience has been most satisfactory and has covered a period of 15 years, during all of which time we have supplied our very first customer. Our trade has been entirely with wealthy families of Detroit, Bay City, and Chicago. The butter is sent by express, in hot weather being kept in cold storage until the last possible moment, then carried to the train, preferably one which will ensure its delivery the same day it is shipped. The utmost care must be exercised if one retains customers. In this way only can it be done:

LET NOT A POUND OF INFERIOR BUTTER EVER BE SENT.

It is to be supposed that the intelligent butter maker will produce none of that kind, but if by any mischance this should occur, it should be disposed of in some other way. A single shipment of poor butter may result in a loss of a customer.

Ship in whatever form your customers desire. It is more laborious to make into prints or even to pack in small jars. Our trade has always called for stone crocks of a size which would hold a month's supply, two, three, or four gallons, as the case might be. There has never been any

complaint that the butter did not keep that length of time. Over the top of the butter place a circle of parchment paper or of butter cloth; never use old muslin which has done duty for other purposes. Place two thicknesses of clean manila paper over the crock, tie snugly with good strong twine and write the address on the top with ink. This is preferable to using express tags which sometimes get torn off.

GIVE GOOD WEIGHT.

Never allow the butter to fall short of the amount the bill calls for. Buy a pad of blank bill heads and send a statement at the time the butter goes. We do not send C. O. D. where the parties have been recommended by other customers, and have never lost a cent by so doing. A check usually comes in a few days, or a few weeks at farthest. As a general thing our customers prefer to return the empty crocks rather than keep them. Expressage on these is five cents each. The larger sizes are sometimes broken in transit, so it is wise to select those which are heavy rather than light. Express charges are the same on anything under fifty pounds in shipping butter, so a few pounds one way or the other makes no difference in the expense.

HOW TO SECURE CUSTOMERS.

Sometimes I am asked by those who would like to supply private customers how to go about securing them. With us our first customer was a relative who was desirous of securing some one to furnish her with good butter the year around. A sample crock was sent and a contract entered into at once at a stated price by the year. It was not long before one of her neighbors wanted to get butter of us also. And in a short time we had our entire supply contracted in this way.

One thing to be guarded against is taking more customers than can be supplied the year around if the contract calls for that. In marketing butter in this way the amount of butter made should be about the same all the time. One needs to have part of the cows fresh in the spring and part in fall or winter. It would never do to have our customers obliged to look elsewhere for butter when it is scarce and high, and we under contract to furnish them at yearly prices if we expect them to buy our butter when it is cheap at the same rates.

Promptness in filling orders is essential. Have the butter ready if possible a little before the time when the order is anticipated. Don't wait for a convenient day, but make it a point to get that butter to the express office. If delay is unavoidable write and say so, naming the day it may be expected.

ADVANTAGES OF THE CREAMERY.

E. A. CROMAN, GRASS LAKE, JACKSON COUNTY.

I believe the creamery has done more in the past three years toward educating the farmer to know how to take the proper care of his cows, and to properly care for the milk and cream before it is churned, than they ever knew before. I am talking now to the average farmer who

has kept only a few cows and who had made his butter at home and never knew how much a pound of butter cost him or whether all or any of his cows were good butter makers. There is lots of good butter made on the farm today just as good as can be made at the creamery, and the farmers who are making this kind of butter know what it costs to produce this gilt edge article. And if a creamery starts in their vicinity generally they are its first customers. One of the greatest reasons why the creamery is better than the home dairy is that its

PRODUCT IS MORE UNIFORM.

You can step into any of our wholesale butter houses and uncover twenty different packages from as many different creameries, and there will hardly be a shade of color difference. How is it with the twenty different packages from the twenty different farmers? Hardly two will be of the same color. Which will sell for the better price as a whole? The creamery every time, although the farmer butter may be of just as good flavor and texture. The

CREAMERY CAN MAKE YOUR BUTTER FOR YOU CHEAPER

than you can possibly make it at home. Why? Because one man will handle, with the improved machinery now found in our butter factories, from 7,000 pounds to 10,000 pounds of milk, and manufacture it into butter in one day. And the butter made from this milk will be all of one grade as to color, texture and flavor.

I BELIEVE IN THE CO-OPERATIVE SYSTEM OF CREAMERIES.

By this system each and every man who patronizes it becomes directly interested in it, for the more pounds of milk that can be got to the factory the cheaper will his butter be made. This also brings the patrons in contact one with the other, and they begin to study each other's methods of handling their herds and caring for their milk, and soon a system of weeding out begins and only the best cows are kept. I have in mind one herd; when our factory started this herd tested 2.8 per cent; now it tests above 5 per cent, and yet this same man had been making butter and selling it, as he had supposed, at a profit. What was the teaching of the creamery worth to this man?

The annual report of the Department of Agriculture for 1898 shows that we are consuming more butter in the United States at the present time than ever before, and also that we do not produce enough good butter for our home supply. I have had it asked me a great many times, will we not overdo the creamery business? My answer has always been, when that time comes then stop building creameries.

DISCUSSION.

Q. Is not the Elgin price two or three cents below the average price for butter sold on that day?

G. H. True: No.

Q. Why does creamery butter bring a higher price than dairy butter?

E. A. Croman: Because of its uniformity in color, salt, texture and flavor.

Q. If a man had 60 cows, would it pay him better to make up his milk or send to factory?

E. A. Croman: It would depend on circumstances. If he had a good sale for his butter he might better make it at home, otherwise take to factory. You can make better butter, or as good at least, in a private dairy as a creamery, because you have control of the milk from the start.

Q. What per cent of milk goes into the cream?

E. A. Croman: Twenty to twenty-five per cent.

THURSDAY AFTERNOON.

L. J. Post, presiding.

QUESTION BOX.

Q. How would an Ayrshire cow do for a city milk man?

C. D. Smith: First rate, except that the thoroughbreds, though gentle, are apt to be nervous and many of them have very short teats.

Q. My cows, carefully housed all winter, were lately afflicted with garget. What is the cause and remedy?

C. D. Smith: There may have been either one of a number of causes—too high feeding, irregular feeding, lying on a cold floor, contagious garget. The remedy is to keep the bowels open by an aperient, the kidneys working by a dose of saltpeter; keep cow warm and comfortable; apply locally hot fomentations or camphorated oil.

Q. Is it necessary to put milk utensils in the sun after scalding?

C. D. Smith: While not necessary, it is advisable where convenient. Sunshine is a great germicide.

Q. Has the increase in butter fat percentage been at the expense of quantity of milk?

C. D. Smith: Yes, to some extent. That is, you can hardly expect to find with the same cow a large flow and a high per cent of fat.

Q. Which is the better silo, round or square, and which is cheaper in the end?

C. D. Smith: For a small herd I urge a square silo, because one can be made of less horizontal area and more ecomonically. For a large herd I recommend the round silo with either horizontal or vertical lining. The square silo is built with horizontal ribs and upright boards.

Q. Will it pay to use commercial fertilizers in general farming in this State?

C. D. Smith: I hope the time will be long delayed when farmers shall begin to rely on commercial fertilizers. You cannot restore lost fertility with this kind of plant food. Most soils long cultivated need humus more than anything else. It may pay to use commercial fertilizers to grow green crops to plow under. It may pay to use them to give wheat a better start in the fall. It may pay under various conditions to use them in connection with barnyard manure, but never to replace it.

Q. Is there any difference between medium red clover, June clover, and mammoth clover?

Geo. T. Powell: Yes; while medium and June clover are the same, the variety differs from mammoth clover in being both earlier and smaller, yielding a better hay. Nothing equal to mammoth clover to restore humus to the soil. Clover silage is liable to rot because of its highly nitrogenous composition. The best silage crop is corn, and because of the large yield per acre it is also the most economical.

Q. Is the Humming Bird separator a good implement for a man having but one or two cows and making butter for the use of the family?

C. D. Smith: It will take the fat all out of the skim milk, which is thus left warm for the calves and pigs. It takes probably a little less work than to set the milk in cold deep setting, but does not affect the quality of the butter except that it dispenses with the pantry kept an even temperature and free from odors.

Q. Is the first milk drawn from a Jersey richer than the first milk drawn from a Holstein?

C. D. Smith: Probably not. The very first milk in either case would be about worthless as far as the butter it contains is concerned.

DEMANDS OF THE PRESENT TIMES IN THE HANDLING OF ORCHARDS.

HON. GEORGE T. POWELL.

One of the first demands upon us is for the destruction and absolute clearing out of all of our old orchards. Everywhere I go I have discovered one general condition—old orchards under the most serious neglect—and it is these that are giving us some of our most serious problems to meet in fruit culture—the competition of products from other sections that are grown upon young trees that are so much finer in appearance, at least. I believe that we should set more young orchards, and co-operate more with young trees; this especially to apply to apple and pear culture. Our culture should be upon a very much finer system. We should give far cleaner culture to all our orchards. Peach growers understand the importance of this, but the same principle that brings such success in peach orchards is sadly needed in the culture of all other orchards. We must most carefully study the demands that naturally come upon us to shorten, if possible, the period in which the orchard will be unproductive for us. We must study the question more carefully than we ever have done before of the productive ability of varieties; of the possibilities of introducing into our orchards the principle of heredity of propensity for earlier bearing of fruits. We are taught by the experience of the past winter the importance of studying constitutional strength and vitality in trees.

BUILDING UP A HARDY ORCHARD.

I began, seven years ago, the propagation of certain varieties of some of our choicest fruits that are known to be lacking in constitutional vigor and am working them upon what I consider very hardy stock, and with many promises of success in this direction. In apple culture I have been using the Northern Spy apple tree as my foundation for everything that I wish to grow. I purchase the Northern Spy trees—set them in my orchards—and then top work them with all the varieties I wish to grow.

The Tompkins County King stands today among one of our choicest varieties in every point of desirable quality. It is an apple that is preeminently sought for in the English market, as well as in our own market, and yet if grown upon its own stock, cannot be recommended because of its constitutional weakness, and when it arrives at the age of profitable bearing condition the orchard is then in the period of serious decline. I have been working the King upon this Northern Spy stock, and have, today, an orchard of this variety which gives every promise of strong vitality and of long life, and I am so firmly impressed with the value of this system of working that I am growing every variety in this manner, at the present time.

MY PROCESS IS THIS:

I purchase two-year-old trees, let them grow one season, and the following year begin budding, setting the buds in the tops in as many branches as I desire to form the top of the tree. If, by any means, the buds fail to grow, the following season grafts are inserted, so that between the buds and the grafts the tree is quickly and surely converted from one variety into the other. At this point is where the principle of heredity is introduced. Necessarily, in the propagation of millions of trees which are grown at present in our nurseries, buds have to be taken to a large extent from the stock that is already growing in the nurseries, and this principle is not altogether the wisest for the purchaser of these trees, but it has been difficult to get trees grown in any other way up to this time. Purchasing the trees as I have indicated, I then choose from the mature trees upon my own place, or upon others, buds and grafts from the most typical trees, in every respect, that can be found. For instance, in selecting the Tompkins County King, buds were taken only from trees that were free from all evidences of blight and disease in any form. In addition to that, the perfection of the fruit was considered, and the general character and form of the growth of the tree. There is individualism not only in trees, but there is individualism also to be discovered in the different buds and different branches of the same tree, and this principle has not as yet been carefully studied and worked upon in the propagation of our fruits, and I believe that if we study this subject carefully we can shorten, by proper selection of buds and grafts, the season before bearing at least one-half in length of time. I have been able to show fine specimens of Kings upon my top-worked trees the third year from the time the buds were set. In the Sutton Beauty, which seems to have a tendency toward early bearing, I have obtained specimens of fruit two years from the setting of the buds. I have been following for a time this principle also in the propagation of currants. And we have through this process been enabled to take from a single bush of currants sixteen quarts. The possibilities of development in this direction are very great, and, in this age of sharp and close competition, I believe is going to be the solution of the most successful fruit culture.

Another point of importance to us in the setting of orchards is the proper

HANDLING OF THE TREE AT THE TIME OF SETTING.

There has been much discussion upon the question of root pruning, but unfortunately, with too many growers the subject is not even thought of, and trees are planted for orchard purposes in the same condition that they come from the nurseries, with the result of long-delayed growth in maturity of such orchards, and, with the general neglect which follows, they contribute to the over-stocking of inferior, common fruit from which we all have to suffer to a greater or less extent. The tree as it comes from the nursery is in no condition whatever to set. The processes of digging are necessarily destructive to the roots—trees have to be dug rapidly, they are pulled out rapidly, they are thrown in great quantities upon the ground, and before they can be gathered up and taken to the packing houses the fine roots are very greatly destroyed, and are of no value to us. We have to depend on another principle from that of the

fine roots to start this orchard into active growth. Hence root pruning is to be done with reference to obtaining vigorous and quick growth of these trees. Not only should all broken roots be pruned, but all roots upon trees; and while I do not believe that for the northern states the theory, as is advocated by some, of very close shortening of the roots upon the Stringfellow plan, I believe we can profitably prune roots closer than we have thought heretofore. We have got to depend upon the main roots of the tree for its real establishment again in the soil, and there is stored up in these main roots the material which is going to furnish us in the quickest possible period of time new feeding rootlets with which to nourish and sustain the tree. If we could examine our trees pruned in this manner we should find within ninety days of the time of setting, according to the degrees of heat and moisture, that an entirely new system of roots had been devoloped at the ends of all of the main roots which we have pruned. If this development takes place early in the season we shall see the tree very largely re-established as it stood in the nursery, with a very fine root system at the end of the season, and also having made a very satisfactory growth in its top.

At the time of planting, the top should be pruned in proportion to its roots. The question of pruning will be largely solved during the first few years of the growth of our trees. With the pruning knife the future of that tree can be largely determined for many years to come. We need to understand the form which we wish to establish in the tree, then for the first five years work to that definite form which we desire. The present demands upon us in orchard management are vastly different from what they were a quarter of a century ago; we have got to grow our trees lower headed and pruned with reference to form such as will make it practicable for us to successfully use spraying materials upon them. We cannot longer deal successfully with old and over-grown trees.

We have to keep in mind that in the great competition of the present times

IT IS QUALITY THAT IS GOING TO TELL

in the end; and, as our system of farming has been extensive, and we must now, for better results, turn to the intensive plan, so in fruit culture. We have been working upon the very extensive plan with the result that we have been producing too large a proportion of fruit of inferior quality, and now in fruit culture we must turn more to the intensive system. It will be for those who have capital to grow fruit upon the extensive plan. The small fruit grower, who contributes so largely to the supplies in our market today, will be far more successful if he will abandon the idea of extensive fruit culture and confine himself to small orchards intensively managed, aiming entirely to produce the finest quality in his production.

I have been observing the quality of the fruits since being in your State, and I find in your markets the same condition as in New York—a very limited quantity of strictly fine fruit, but an abundance of very common, and even inferior, fruit. This is one of the curses of our fruit culture today—there are too many people in the business who are growing fruit as a secondary matter entirely, with no interest in its whatever, who make no effort to produce fine fruit—take what escapes all the ravages of insects and disease and, infected as badly as it is, they will

barrel it up and put it on the market. Such fruit as this ought to be kept out of the market, and a man who will insist upon putting on the market such a fruit as this ought to be absolutely put out of the market also.

There are various conditions which need to be carefully studied in the selection of

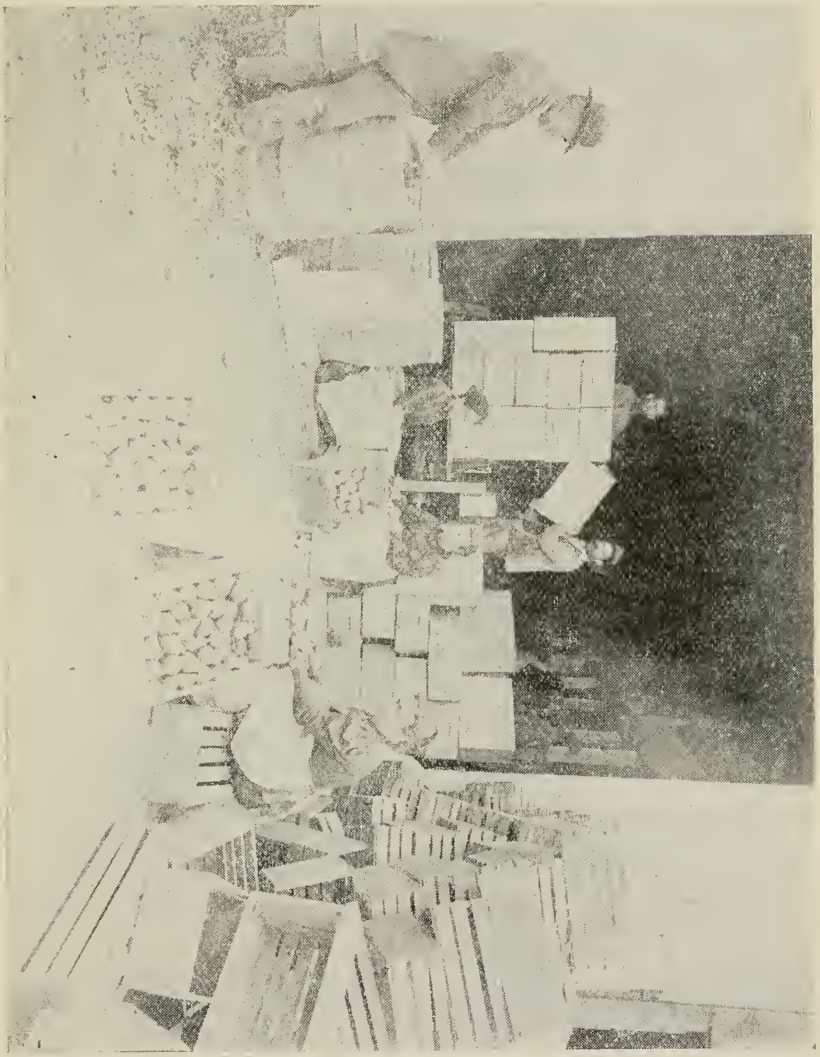
LOCALITIES FOR FRUIT GROWING.

Not only should the soil be carefully studied in relation to its fertility; and in relation to its elevation; and in relation to its possibilities for drainage; but we should study atmospheric conditions as well as those of the soil. Undoubtedly one of the great lessons to be learned from the present calamity to our peach industry this year will be the danger that follows attempting to grow peaches where the atmospheric conditions are not congenial to them.

It was my privilege to spend a week in the land of the big red apples—in the Ozark mountain region. I discovered a peculiarly fine condition of the bark of not only fruit trees, but also of the forest trees, and my observations led me to the belief that in this Ozark mountain region there is a peculiarly genial fruit atmosphere. When riding through that great country, and coming in sight of block after block of Ben Davis apples—covering one hundred acres in solid blocks—I became thoroughly convinced that the apple growers of New York, or of Michigan, or any of our northern states had better forego the planting extensively of this variety of apples, for two reasons. (1) That there are enough Ben Davis apples grown in Missouri to supply the whole country; and (2) the Ben Davis could be grown better there than anywhere else in the country. While it has been an apple that has sold remarkably well, the time is coming when, from the fact of its recognized poor qualities, it will be rejected in many markets, and hence it is not wise for those in our northern states, who can grow apples of the very finest and highest quality, to attempt to put their lands and orchards in competition in this variety with the very extensive plantings of orchards in other sections where the climate is congenial to giving them the best quality that can be put in the Ben Davis apple.

I believe it is possible, through the propagation upon the hardier stock, for us to again grow the choicest, perhaps, of all apples in the list—the Spitsenberg. I believe it will be possible for us to grow that beautiful, high-flavored, Johnathan, if we will properly select and propagate upon the vigorous Northern Spy stump, and the more we can place before purchasers and consumers fruits of such qualities as these the more rapidly we shall increase the consumptive demand for our apples.

We are being pressed by competition very rapidly from the Pacific coast. The Pacific coast fruit growers being removed several thousand miles from the best markets of the world, have been forced to study out most carefully the best methods for marketing their fruits, and by their very careful system of grading; by putting their choice fruits in uniform packages, so that buyers know exactly what they are purchasing in quantity and quality, their fruits are meeting with most popular sale everywhere in the markets of the world. And one of our urgent present demands is for us to study more carefully our methods of marketing that we may put up our fruits better graded; that we may put them in more



uniform packages; that we may put them up more in boxes, and less in barrels; that we do more wrapping of our fruit to preserve it in the best and finest condition when it is placed upon our markets. These are some of the present demands that are urgent upon us in the handling of our orchard interests. And there is no field that promises more in the present time of encouragement for the profitable using of land than in the cultivation of our fruits of any and all kinds, provided we will grow them of the finest quality and place them on our markets in the best possible and most attractive condition.

DISCUSSION.

LED BY PROF. L. R. TAFT.

Commends the good advice of Mr. Powell in the matter of the destruction of old disease-bearing orchards, but people are too conservative to do it. It would certainly reduce the dangers from insect and fungus diseases. Apples promise splendid returns for new orchards. Many old orchards, with but decent care, have this year given good returns. With but slight expense many of these can be brought back into fruitfulness. Take the best of the old orchards, spray, prune, break up sod and cultivate, and you will soon get returns in enlarged fruit yields.

Crimson clover is a most valuable cover crop, but on certain soils other crops, though less desirable as a supply of plant food, are, all things considered, better. Crimson clover is not, for instance, well adapted to clay soils. I suggest oats for that class of land. They may be sown in late summer, and yet make a strong growth in the fall. They are killed by the winter, but give a good supply of humus as well as act as a mulch on the hard clay, softening it and improving its physical characteristics. Orchards call for abundant fertility. Big crops necessarily exhaust the food supply, hence the necessity of frequent application of barnyard manure, unleached ashes, ground bone, and cover crops.

Spraying must not be neglected at the proper times and with the proper materials, arsenites, Paris green, white arsenic. Spray early and frequently. For scale insects and plant lice use a mixture of kerosene and water rather than kerosene emulsion. For fungus diseases use Bordeaux mixture or copper sulphate solution.

J. N. Stearns, Kalamazoo Co.: Is one pound of copper sulphate to fifteen gallons as good as one to ten?

L. R. Taft: One pound to ten gallons is undoubtedly somewhat better.

Q. What are the proportions of kerosene in the kerosene mixture mentioned?

L. R. Taft: For dormant trees use one of kerosene to four of water. For ordinary plant lice make it one to fifteen. For plum aphis one to eight is sufficient.

Q. How do you prepare white arsenic?

L. R. Taft: My method is to boil for a half hour one pound of arsenic and two pounds of lime in two gallons of water, then mix with 400 gallons of water.

FORESTRY.

FORESTRY CONDITIONS AND PROSPECTS.

F. E. SKEELS, LANSING.

The topic, forestry, seems entirely appropriate in a convention that has for its object the improvement of Michigan and her people. Climatic changes are calling our attention to the benefits we formerly derived from the areas of standing timber. The small streams, no longer held in check by the mass of leaves, humus and other forest waste, have changed from

their continuous even flow to seasons of freshets and drying up. The air currents, no longer checked by the woodlands, cause the moisture to evaporate from the constant fanning, often producing droughts. The purifying effect of the woods upon the atmosphere, their simple beauty, and their commercial value all tend to make the subject one of interest. The average resident of the southern portion of the lower peninsula seldom realizes the facts as they actually exist in more northern Michigan.

THE PRESENT CONDITION OF FOREST AREAS

is not as we might wish it to be in order to produce good results in a short space of time. We find that less than ten per cent of the timbered lands in the lower peninsula is the property of the State, and that the remaining ninety per cent of this class of land is owned by men who care only for the merchantable value the timber may be made to produce, and these areas might be entirely denuded in the next year if these proprietors so willed.

The timber of southern Michigan was cut under entirely different circumstances from that in the north. Here in the south it was cut to prepare the land for the plow, and nearly every settler left a wood lot from which the over-ripe timber is removed from year to year for fuel or lumber. As a result we find small bunches of timber scattered all over the counties in and south of the Saginaw and Grand River valleys. Land was not cleared for agricultural purposes in the north, but the timber was removed by the square mile and solely for the value of the timber itself. A large quantity, unfit for the mill was left standing or lying on the ground, to be licked up by the first forest fire, unless convenient to railroad by which it could be carried to the distant city as fuel, or to the coal kiln where it was made into charcoal or wood alcohol. Most of the tracts were too far away to allow the refuse timber to be handled at a profit, and blackened trunks, logs, and stumps are the only remaining traces of the once thrifty forest.

The remaining timber lands in the State are fast becoming the property of the manufacturers in wood, and the only bits of original woodland that we can hope to save are the little parcels left by the farmers for fuel or sugar orchards, unless, indeed, some of the larger timber owners see fit to present the State with some timbered lands to be held as forest preserves. The present condition of the forests in Michigan we find not very flattering.

WHAT OF THE PROSPECTS?

For an answer we must look to those great areas that, black and dreary, stretch away mile upon mile, in nearly every county north of a line drawn westwardly from Saginaw Bay. This great scope of country was once covered with the finest original forest that ever pleased the sight of man. Most of it was then the property of the State, and in order to extend improvements and make room for an ever increasing population, these immense tracts were given out to railroads and other corporations, or sold at a low figure to acquire capital for the support of the great educational institutions of the State. In the development that was to follow the timber must be removed.

The greater values being at first found in the pine, we find that variety of timber being cut first. Now follows the hard-wood, until the great forest has nearly disappeared, and we find these lands again coming back to the State as tax lands. As a State we have been acquiring these old choppings until much more than half of the lands in some of these northern counties are now on the books in the office of the Auditor General as State tax lands. This has been brought about by the refusal of the proprietors to pay taxes after they have stripped the lands, and the area thus acquired is increasing year after year. The largest area of this class of lands would be embraced in the territory covered by Clare, Gladwin, Missaukee, Roscommon, Ogemaw, Iosco, Kalkaska, Crawford, Oscoda, Alcona, Otsego, Montmorency, Alpena and Cheboygan counties. The lands held for taxes in these fourteen counties comprise a total of about two million acres, and much of it is in blocks of entire sections and in many instances entire townships. This great tract has already produced a forest of world wide fame, and it has been clearly demonstrated that land that has once produced timber will do so again; and in fact we find that Nature is doing this already when given a chance. Evidences of Dame Nature's ability to hide her scars are not wanting, for wherever we find an old windfall or cutting that has escaped continuous annual burnings, we find a fine second growth of timber, much of it already large enough to be valuable for manufacturing purposes. From examinations made in old wind-falls and choppings in these northern counties we find that

TIMBER OF VALUABLE SORTS WILL GROW

to a merchantable size in from twenty-five to forty years time, without any care whatever. An acre of this second growth timber, measured in an old wind-fall, which in the early fifties was noted by the government surveyors as being burned over and grown up to briars and underbrush, contained 383 trees from four to eighteen inches in diameter and made up of the most valuable varieties of hardwood, being mostly sugar maple, rock and grey elm, basswood and white ash.

Within the boundaries of the fourteen counties above enumerated, is located the most beautiful and bountiful water supply that can be found in a state that is everywhere noted for having the best of everything. Thus in Roscommon county we have the Houghton and Higgins lakes, in Otsego we have Otsego lake, and each of the other counties is plentifully dotted with small, deep lakes, fed from springs, and from their depths flash back the silver and gold from the choicest of the finny tribes. These numerous reservoirs, containing the purest water on the globe, give rise to nearly all the river systems north of the Saginaw and Grand River valleys. We there find the Manistee river flowing from the lakes in Otsego, Kalkaska and Roscommon counties, with its outlet in Lake Michigan, and the Au Sable river rising in the same territory, but flowing easterly to Lake Huron. Higgins and Houghton lakes unite their waters and send them down to Lake Michigan by way of the Muskegon river. The numerous small lakes of Montmorency county find their outlet in the Thunder Bay river and its tributaries and reach Lake Huron at Alpena. To the north of all these, with its western terminal near the center of Antrim county and extending eastward to the center of Montmorency, we find the greatest water-shed of the lower peninsula, and

covered with the finest hard wood tract now left in the State. This water-shed is not crossed by any streams, but its northern slope is gullied and creased by the myriad of creeks and spring brooks that unite to form the Pigeon, Sturgeon, Black, Rainy and Ocqueoc rivers that find their outlets in the Straits of Mackinac and Lake Huron.

Some of the best portions of this territory are almost entirely owned by the State as State tax or as tax homestead lands, and comprise

AN IDEAL LOCATION FOR A FOREST PRESERVE.

Within this area is found nine-tenths of the game yet left in the lower peninsula, and every lake and stream abounds in the choicest varieties of fish. These facts should enlist the sportsmen with us, for without the forest shelter the game will soon disappear and the streams become sluggish or dried up entirely.

IN ORDER TO BRING ABOUT THESE RESULTS

we must have:

First, Legislation to perfect the title of these tax lands to the State.

Second, Legislation to set aside certain tracts for forestry preserves and to provide for the care of the same.

Third, Stop the stealing of the timber from these lands by rigidly enforcing the laws we already have for the protection of timber on the public lands.

With these suggestions carried out, Nature will soon cover these waste lands with another forest, which will in time become the pride of the State and add greatly to its wealth.

DESIRABLE FORESTRY LEGISLATION.

HON. I. H. BUTTERFIELD, AGRICULTURAL COLLEGE.

In 1664 John Evelyn, in England, wrote a work on forest trees, entitled "Sylva," in which he says: "Men seldom plant trees till they become wise—i. e., till they grow old and find by experience the necessity of it." This is true of states and of nations. The people of this country have for more than one hundred years been employed in cutting and destroying forests and have given little or no attention toward preserving them. As in the cultivation of the soil, the American farmer in New England or Virginia exhausted the soil by continued cropping without proper fertilization, and then moved on toward the west to other virgin soils to begin the exhaustive process on them, so the Maine lumberman, when the pine forests grew small under his ruthless hand, moved to Michigan, then to Wisconsin, Minnesota, Washington and Oregon, successively. The cutting and manufacture of timber for commercial uses is certainly legitimate and proper, but while this has been going on we have, as a people, forgotten that our forest area is being completely destroyed. The cut-over lands on which much small and rapidly growing timber is left from the first cutting remain in such condition that sooner or later fires destroy the remaining timber and also the vegetable mold on the surface which is needed for growing trees.

I will not attempt to discuss the question of the absolute necessity of forests to a country. This should be apparent to every one—we should profit by the experience of the older nations of Europe, who, for self preservation, were years ago obliged to take measures to preserve forests and reforest waste places.

SOME FOREST LAWS IN EUROPE.

In Austria the forest laws prescribe and control not only the culture of the forests belonging to the imperial domain, but also of all the woodlands which are the property of municipalities, private corporations, and private individuals. The net revenue from state forests is 400,000 florins annually.

The area of German forests is one-fourth the area of the empire; and the net revenue is nearly twenty-four millions of dollars. Germany has an area about four times that of Michigan, and has a population of nearly 50,000,000 of people.

Italy has ten million acres of forests. All these countries maintain schools of instruction in forestry, where young men are trained in the care and management of forests.

IN THE UNITED STATES.

New York is the only state to begin this educational work, and has lately established a chair of forestry at Cornell University. Several states have legislated regarding forestry, but New York and Pennsylvania are all that have actually established state forest reservations. New York has established a large forest in the Adirondack region and has set aside a tract of 30,000 acres as an experimental forest. Pennsylvania has made provision for three forest reservations, each to consist of not less than 40,000 acres, and to be located at the headwaters of the three principal rivers of the state.

Wisconsin and Minnesota have enacted laws for the prevention of forest fires, and Wisconsin is on the eve of enacting a law creating state forests; the result of the report of a forest commission appointed two years ago with instructions to recommend legislation.

The United States government has set aside certain tracts as forest reservations, but no systematic work has been done looking toward their preservation or improvement.

PROTECTION AGAINST FIRE.

One of the most important legislative enactments relative to forestry is something that will give more efficient protection against the ravages of forest fires. Without this forestry is impossible. And there are some problems to solve in this connection, owing to the prevailing custom with lumbermen of leaving so much rubbish, which as soon as it becomes dry not only invites a fire, but makes it well nigh impossible to extinguish one when once started. It will be necessary to make some provision for the safe disposal of this waste, since to allow it to remain invites disastrous fires which no legislation can prevent nor extinguish.

Rather than this, it seems to me best to adopt the Wisconsin method and

PROVIDE FOR THE APPOINTMENT OF A FORESTRY COMMISSION

which shall be instructed to make a thorough investigation of the conditions existing in this State; taking into consideration the lands belonging to the State known as the State tax lands or those which have reverted to the State for the non-payment of taxes, and report to the next legislature a plan of a permanent forest policy. This plan is safe, business like, and would tend to avoid expensive mistakes—and much better than adopting a plan copied from some other state, but which might not be suited to the conditions which exist in this State.

As a suggestion for the location of State forests I mention three desirable locations where reservations of 40,000 acres each can be easily secured and which are in every sense desirable locations. The first is in Roscommon county, taking in Houghton and Higgins lakes, and the sources of the Muskegon, Titibawassee, and Rifle rivers. The second in Otsego county, covering the sources of the Manistee, Au Sable, and the streams that flow northward. The third in the upper peninsula, covering the highlands which are the sources of the numerous streams which flow north to Lake Superior, and south to Lake Michigan.

A permanent forest policy should also include the encouragement of private forests and tree planting on all farms in order that every square mile shall have the benefit of forest protection.

DISCUSSION.

A. P. GRAY, GRAND TRAVERSE COUNTY.

They that are sick need a physician, but we in Grand Traverse county have not many of the diseases mentioned this afternoon. We intend to prevent the coming of these diseases by wind breaks and by feeding balanced rations to the trees. In northern Ohio people felt that they could not raise apples profitably. The trouble was that when intervals between profitable crops grew longer they stopped caring for their orchards. Apples can be made profitable by good care.

This care should be directed in the first place towards preventing exhaustion of the tree in ripening unnecessary seeds. Thin mercilessly when the trees are overloaded. If three apples are left where but one ought to grow, you exhaust the tree and soil three times as fast as you ought. There ought to be no off years, but a crop every year. This is made possible by thinning. Wind breaks save the injury to trees.

J. N. STEARNS, KALAMAZOO COUNTY.

On the road between Kalamazoo and South Haven there is a strip of most excellent land. Along this road there used to be good crops of apples. Why not now? Simply because farmers have grown other crops in the orchard to exhaust the soil and have neglected the orchards. They have neither pruned nor cultivated nor fertilized nor sprayed.

The danger of an excessive development of blossoms and excessive fertilization of these flowers points out the reason for pruning. Therefore prune severely. One orchard between Kalamazoo and South Haven bore a good crop of fruit and became thrifty because the owner trimmed it thoroughly, thereby concentrating the vitality into the remaining blossoms.

No fertilizers had been applied to the orchards between Kalamazoo and South Haven, yet wood ashes were available. In fact, one farmer whose orchard sorely needed this fertilizer sold his wood ashes at a low price.

Q. What crop should be grown in the orchard the first four years?

R. Morrill: Men usually seem to try to see how much they can get out of the soil of the orchard. This is a serious mistake if carried too far. For two or three

years a crop should be grown in the young orchard, and that crop one that ripens at the same time as the tree. Put in a crop that takes the moisture from the soil most when the tree ripens, for example, corn or late potatoes, though the latter is objectionable because it requires the ground to be stirred up by the digging at too late a time in the fall. Above all things, do not adopt the policy of trying to get all you can from the orchard by way of other crops when at the same time you want the trees to make all the growth they can be forced to make.

Mr. ———: Don't plant late potatoes. They stir the soil too late in the season. The crop will not pay for the damage to the orchard.

R. Morrill: Make the bodies of your trees short by so pruning as to have the branches grow low down on the trunk. Melons have proven a good crop to grow in the orchards. It is not hard to properly cultivate an orchard with low tops. Use first a plow properly rigged to plow as close as convenient; second, a gang plow, and third, a harrow with rope attached. You can get within two or three feet of the trunk of the tree with the last tool mentioned. It is true that I cultivate my peach orchards from forty to fifty times during the season.

Prof. L. R. Taft called attention to the College exhibit in which there were some pictures of cross sections of trees grown under experiment by the Illinois station, and showing by the difference in size of trunks the benefits of tillage.

Mr. Graden: In this discussion so far the relation of bees to horticulture has been entirely omitted. If the season is bad for bees, the fruit crop suffers because the blossoms are not fertilized. Bees ought therefore to be considered a branch, and a not unimportant branch of horticulture.

Mr. ———: Fashions change. Forty years ago an orchard of 1,500 trees was set out by a neighbor of T. T. Lyon. These trees were headed low, not more than three feet from ground. Two or three years later the branches had so spread that it was practically impossible to get within twelve feet of the tree with a plow. The orchard was then trimmed in, cutting off big branches. Then the limbs died and it was impossible to get the tree in good shape again.

F. W. Dunham: Would you not raise some Ben Davis for market?

R. Morrill: No! Certainly but very few.

F. W. Dunham: A lot of trees were purchased from the Monroe nursery, and among them a lot of Ben Davis, and set out several years ago. This year the Ben Davis returned ten dollars per tree and the Kings and Baldwins but five dollars each.

R. Morrill: Don't draw conclusions from the experience of a single season. Last year there were few Ben Davis apples and prices for them ruled high. The market grows more and more discriminating every year, hence the advice not to grow Ben Davis, which, notwithstanding its fine appearance, is not a good apple.

Jas. Dunn, St. Clair Co.: A neighbor took an old orchard in bad condition and by grafting and good care has made it one of the best orchards in St. Clair county. He learned how to do it at a Farmers' Institute. He drained the ground well, and practices sowing something in the fall for green manure. Formerly he used to think there was no money in fruit. Now he has changed his methods completely, goes at it in a business way and succeeds.

Q. Can we set out young Spies and by grafting secure a crop as quickly as by regrafting old orchards?

Geo. T. Powell: Not quite. In grafting I call your attention to the advisability of securing scions from bearing trees. One trouble with nursery stock is that the nurseryman continually uses his cuttings for scions. Care in selecting scions from trees that not only bear large crops, but crops of typical fruit will repay for the trouble many times over. You get in this way a hereditary tendency toward fruitfulness.

Mr. Dunn: I know of orchards set out twenty years ago that bear no fruit yet. Can we get fruit in ten years if we set the trees out now?

R. Morrill: Yes, and in less time.

L. J. Post: You can do it by whip grafting.

A. P. Gray: Is it necessary to look after air drainage in selecting a site for an apple orchard?

R. Morrill: Not so necessary as for peaches.

THURSDAY EVENING.

C. B. Charles, presiding.

SOME UNSOLVED PROBLEMS.

HON. J. E. HAMMOND, SUPT. OF PUBLIC INSTRUCTION.

America is pre-eminently the land of universal education, the land where the son of the humblest citizen has a chance to win his way to an equal footing beside the favored child of fortune. Theoretically our public school system is the avenue through which is to come happiness to the common people. But as the labor problem grows more and more complex, our social reformers and philanthropists are beginning to question if, after all, our educational methods are not engendering a dislike for manual labor, and breeding an indisposition to perform the humbler duties that must be done by at least three-fourths of mankind. They ask, "Does not the farmer's son too often leave school with a distaste for his father's occupation? Is not the poor man's daughter frequently educated above the homely duties of every-day life? Does not the average graduate of our secondary schools in a sense scorn the day-laborer, be he ever so honest and industrious?" These are serious questions, and a negative answer is by no means so certain as one might wish.

Indeed, among the humbler ranks of society, the chief motive today impelling parents to make sacrifices for the sake of educating their children seems to be that they may make them so-called "ladies and gentlemen." In view of these facts, it behooves all educators to consider most seriously how best to avoid the inculcation of these false views of life, while endeavoring to

ENRICH AND BROADEN THE COMMON MIND BY EDUCATION.

Surely there must be some way to teach that honest toil never degrades; that labor alone gives relish to pleasure. Otherwise universal education becomes a questionable blessing, for among the masses there must ever be many farmers, mechanics, carpenters, and day-laborers of all sorts.

The professions have long been so over-crowded that there's only room at the top; and business positions are so eagerly sought that, though the wages of clerks, book-keepers, and stenographers are reduced to the merest pittance, still the supply exceeds the demand. It would seem, then, that one important part of our public school work is to instill a deeper respect for the workman, a greater appreciation of the value of skilled labor, that there is an increasing demand for people who can "think with their hands." For, 'mid the dust and clamor of mill and factory, 'mid the clink of anvil and hammer, great results are growing; and wherever the genius of man keeps the wheels of industry turning, there must the humble toiler perform his part in the world's economy.

"O'er the forge's heat and ashes,
O'er the engine's iron head,
Where the rapid shuttle flashes,
And the spindle whirls its thread,
There is labor lowly tending
Each requirement of the hour,
There is genius still extending
Science and its world of power."

It was largely a desire to correct the increasing desire for gentility and the false ideas of life that first led to an introduction of the

MECHANIC ARTS INTO OUR PUBLIC SCHOOLS.

Some of the larger schools have carried the experiment to success, and manual training departments are multiplying on every side. Our conception of education is changing, and even school men are coming to concede that education is anything that makes for culture and efficiency. Manual training rounds out the powers in the fullest way by correlating hand and eye, and motor education, by developing the motor parts of the brain, likewise develops pluck and courage. But motor education, to be effective, must come in youth while the motor areas of the brain are growing. This is one of the strongest arguments advanced by those who advocate manual training in lower grades, for they say boys should begin to learn a trade before reaching their teens, just as a child must begin early to learn to play a musical instrument if he would become an expert player.

Attention is called to the fact that boys naturally like to be busy. In Menominee, Wisconsin, where the Stout Manual Training School has been in operation for a number of years, there is said to be no street loafing among the boys, who eagerly embrace every opportunity to work over-time on some article to furnish or decorate the home; and the shops are kept open until 9 p. m.

Much of the manual training in our schools has thus far been confessedly experimental, and simple exercises in drawing, modeling, and wood-working have usually characterized the beginnings, though some of our large cities like St. Louis and Chicago, now have quite extended manual training departments. A goodly number of our public schools are taking the stand that there should be at least enough manual training to assist in relating the school work to any manual occupation that may be undertaken in after life. The schools of Washington, D. C., furnish a good illustration of this method of keeping the educational idea paramount, but recognize the practical side by instruction in joinery, wood-turning, pattern-making, forging, cooking, and sewing, the course being obligatory in grades 7 and 8, and elective in the high school. But by far the larger number of schools have taken up manual training without any reference whatever to trade, but simply for the education of hand and eye, a training that shall lead to greater development of latent genius to more versatility and resourcefulness.

GERMANY'S EXPERIENCE

furnishes a lesson on the value of industrial training which America may

well ponder, since it is just this that makes her so prosperous. In 1876, at the World's Fair in Philadelphia, Germany was so eclipsed by other nations, in the fields of art and industry, that the German Commissioner frankly cabled to Bismark, "Our goods are cheap, but wretched." Then the twenty-six German states resolved to use a part of the war indemnity paid by France for the education of their workmen. Numerous industrial schools were at once established, also forty commercial schools in which were taught all questions affecting foreign trade—the language, tariff laws, industries, productions, exchange, monetary systems, railway fares and freight rates, traffic rules of rivers and railroads—in fact, all the particulars of trade in the markets of the world; and thus has Germany been able "to storm the foreign markets," in less than a quarter of a century increasing her manufactures ten fold, and establishing such an export trade as has astonished even England.

The agricultural world has for some time realized the need of a general

TRAINING FOR THE FARMERS OF THE FUTURE;

and through the multiplication of agricultural colleges and the far-reaching influences of Farmers' Institutes, the discoveries of science are taking a firm hold on agricultural methods. Many communities are feeling the broadening effect of scientific efforts exerted in the farmer's behalf; and the more the farmer's son is taught that biology, chemistry, philosophy—that all the utilitarian sciences may contribute to his ultimate success—the more will he feel that there is no nobler calling than that of "the toil-worn craftsman who, with earth-made implement, laboriously conquers the earth and makes her man's."

Our Michigan Agricultural College has recently made a commendable addition in shape of a new cooking laboratory, and offers an especially strong course in

DOMESTIC SCIENCE AND HOUSEHOLD ECONOMY.

It is surprising to find how many families depend on the bakery for food that is far less nutritious and appetizing than home cookery, besides being much more expensive. The founder of Pratt Institute has said, "The man who earns $10 per week will have a more attractive and happier home with a wife trained in household economy than the man who receives twice as much, whose wife has had no training in domestic economy and thrift."

If, in our larger cities more attention could be paid to these cooking schools, more general interest created in the culinary art, not only would more girls be made "help-meets" for their future husbands, but the servant girl problem would be partially solved.

Dr. E. Benjamin Andrews, Chicago's new school superintendent, is in full sympathy with the demand for practical teaching, and thinks there should be one distinctively commercial high school in that city, and that the instruction in night schools should include book-keeping, stenography, telegraphy, commercial law, and commercial arithmetic.

Another phase of the child's education beginning to attract attention is that of practical

ECONOMY IN THE WAY OF SAVING

—the instilling of the old doctrine that "a penny saved is a penny earned."

The greatest obstacle is undoubtedly the heavy burden of responsibility it imposes on the Superintendent, and the necessity for depositing in local banks which are not always reliable. In European countries these difficulties are obviated by the government guaranteeing the safety of deposits through a system of Postal Savings banks, which system has the advantage of reaching both parents and children, sending its missionaries to school, home and factory, to explain the principle of the savings bank.

One very puzzling problem pressing for solution in our high-schools and colleges is connected with

ATHLETIC GAMES.

It is the opinion of most educated Englishmen that the playing of foot-ball in the public schools of that country has much to do with the courage, address, and energy with which the graduates of Rugby, Eton, and Harrow have made their way through dangers and over difficulties in all quarters of the globe. Still, in this country, the principles of competition and championship are carried too far. I am glad to know that our leading educators are giving much thought to this problem, trying to find the best method of eliminating the evils of the game, and of building up that regard for fair play, that deference to the decisions of the umpire which is so conspicuous in English games.

THE HYGIENIC CONDITIONS OF THE SCHOOL,

the health of pupils and their home surroundings, children's maladies and the limitations of mentally deficient children—all these are among the problems that are being considered by the practical pedagogy of the day. In consequence, the varying degree of ability possessed by different pupils is coming to be recognized more and more, and the pernicious practice of making some children "mark time" while those of slower intellect catch up to them is almost done away with, though the time is not so far distant when it was considered almost a crime to permit any breaking down of grade lines, and every child was squared by exactly the same measure, and made to comply with exactly the same requirements.

Progress in any line is best counted by decades. Since the days of Father Pierce a great advance can be noted, and so many educational problems have been wisely solved that we have full faith in the ultimate realization of all that our school system is meant to accomplish. We believe that our schools can inculcate such views of life among the great working class as shall help them to appreciate

THE TRUE DIGNITY OF LABOR,

and inspire them to become skilled and proficient laborers. But the school of the future must give increasing emphasis to the thought that the only true nobility comes through toil of brain or heart or hand; that "science and industry are God's hand-maids" by whose aid we gain the consummation of life. Thus shall universal education fit for the special

vocation as well as for the higher relations of life, and enable its recipients to become loyal, useful, intelligent American citizens.

When the Puritan Fathers first landed on these uncultivated shores, it was not their undaunted courage and high ideals that made the wilderness to blossom as the rose; it was untiring industry that changed the haunts of the wild beast into an abode for civilized man, that laid on that rock-bound shore the corner stone of a republic that should be known as the land of the free, and the home of the brave, as also the laboring man's best refuge.

America's province is to elevate not the few, but the many; to bring about a universal prosperity by the greatest possible encouragement of the arts of peace. The world will not yet completely learn the great lesson of honor to the working classes in proportion to their industry and merit.

"Let Labor, then, look up and see
His craft no path of honor lacks;
The soldier's rifle yet shall be
Less honored than the woodman's axe."

DISCUSSION.

PRESIDENT J. L. SNYDER, AGRICULTURAL COLLEGE.

This is an age of problems—there have been many problems solved during the present century. Within the memory of some of those present tonight the sailing vessel has given way to the monster of the sea; the man-of-war with its exposed hull and high rigging to the floating citadel, such as our Oregon and Massachusetts, each of which will consume a million dollars worth of ammunition in twenty-four hours. The flint-lock musket to the modern weapon of destruction. The old stage coach to the lightning express with all the home comforts and conveniences. These advantages are not for the few alone; there is scarcely a community which does not hear the shrill voice of the locomotive. For years after this century was ushered in there was not in all the farm sheds of the world a single plow with a steel or metal mold-board. The harvesters of the wheat fields of all countries cut the grain with sickles. There was little leisure time for anybody except the rich, who had in most instances obtained their wealth through government grants. Little research had been made in the domain of science; chemistry, physics and botany were idle dreams except to the very few, and their knowledge of these subjects was as nothing compared with the present knowledge. Biology, bacteriology and other important fields of science were unknown. By the aid of human devices

THE POWER OF THE EYE HAS INCREASED

a thousand times and the ear can hear the voice of a friend hundreds of miles away. If we have anything to say that people are anxious to hear, we can talk through the press to hundreds of thousands of people, and if it be of paramount importance to the world, hundreds of millions will be moved by our acts or thoughts before the earth makes one revolution on its axis. The onward march has been along all lines of activity. The steam engine has revolutionized the world. Hand work has been superseded by that of machinery. This all redounds to the advantage of mankind. Hours of labor have been shortened. More time is left for leisure and intellectual development. Commerce makes it possible to place on the table the best food of all lands without giving it a thought as we sit down each day to our meals gathered from all corners of the earth. The direction of the storm is foretold days ahead and notice given to prepare for it.

THE INTELLECTUAL HAS KEPT PACE WITH THE MATERIAL.

The eight-page daily has found its way into all parts of the country and almost everyone has the privilege of reading the news of the world. Cheap books and

free libraries place the best thoughts of the world before everyone who has a desire to read them. Free public schools, free colleges and universities make it easy for anyone with brains and ambition to secure an education. Moral and religious advancement is exemplified in free churches, free hospitals and all those comforts which help the weak and unfortunate. Fifty years ago there was not a Christian on the Feejee Islands, and now there is not a heathen.

With all this great progress come great obligations. How shall we prepare the coming generations to meet these responsibilities? I know of no other way than by education. Every boy and girl should be educated. The time is past when only the few should receive such training. In the next generation there will not be much room for the man who can simply work with his hands. This is a great industrial age and it seems to me that our educational system should recognize this fact and conform to the new conditions. There is a strong tendency, I believe, to educate young people away from industrial pursuits, and instead of fitting them for the work of life they are sometimes unfitted for the sphere which they are destined to occupy. There are too many who have an idea that the object of an education is to be prepared to live a sort of genteel life, free from labor, and especially free from manual labor. There are too many parents who would like to educate their children so that they will not have to work for a living as they have been compelled to do. If that is all there is in an education, it is not worth striving for. The person who goes through this world without work, and plenty of it, is not of very much account either to himself or to society. The average school life in this country, including those who attend high schools, is a little over four years, but most of the children of our working classes receive but a very little over three years of school training. Seventy-five per cent of these never get beyond the third reader. Of all the boys who have remained in school until they are twelve years of age, four-fifths drop out before they are two years older. Of every one hundred young men on this continent only five are prepared and equipped by education for their occupation and business; ninety-five are not.

Science and invention have been forces to relieve men of much of the toil and drudgery of life, but to apply science and machinery to every day affairs requires knowledge and skill. Everything in the shop and on the farm; in the counting house and on the street, works according to fixed laws. If we work in accordance with these laws all will be easy and success will usually follow, but when through ignorance and the lack of education we disregard these laws, failure is the inevitable result.

By making practical work a part of our education, pupils will remain in school longer. They will realize that they are preparing for the work of life. Give the farmer boy some work which he and his parents can see will be of use to him after leaving school and he will not drop out of school at the first opportunity. Science can do as much for the kitchen as it has done for the workshop. Make the education of the young woman bear some close relation to the life of the home.

DISCUSSION.

Andrew Campbell, Washtenaw Co.: We heard this afternoon that brain power is necessary for success in farming. We have but limited brain power at best, and that must be developed to the full. In many cases this development is curtailed because boys and girls are taken from school too early. How can this be avoided? By bringing the high school nearer to us. If we had a township system whereby in every township there should be a central high school which the children could attend and at the same time board at home, it would go far to solve the problem.

HOW TO INTRODUCE THE STUDY OF AGRICULTURE MOST PRACTICALLY INTO OUR PUBLIC SCHOOLS.

HON. GEO. T. POWELL.

For many years there has been a marvelous growth of cities, and the tendency of population to migrate from our rural districts to cities has

given rise to some very important problems. In 1895, there was found in the great city of New York 40,000 able-bodied men who had drifted into that great city, which was already over-crowded by people who were seeking employment. These men were not criminals, tramps, or paupers, but steady, industrious men who had found their way to this great city for the purpose of improving their condition. This gave rise to a special inquiry into

THE CONDITIONS OF THE RURAL POPULATION

of the state which was causing such great numbers to congregate in the cities. We sent out a series of questions bearing directly upon these points, asking for definite information regarding the value of the land upon which they were living, its depreciation, and causes for such, if there had been a serious depreciation during the past thirty years. The tendency, if there were such, on the part of the people to leave their farms, and the causes which were responsible. As to whether their public schools were as well attended as they were thirty years ago. As to whether farmers were reducing indebtedness. As to whether they could show any margin of profit on a fair valuation of their land. As to whether the principles of agriculture were taught in any form whatever in the public schools.

IT WAS ASCERTAINED

that seventy-four per cent of the answers obtained indicated a direct tendency on the part of rural people to get away from their farms. In many instances schools were not only attended by less numbers, but in some of the districts schoolhouses were entirely closed for want of sufficient children to attend the school. A careful study was made with reference to offering suggestions upon work that might be done to check this tendency of population to drift so largely to cities. The only suggestion which appeared along this line of study was in the possibilities which education will afford in the solving of some of these very vital problems. If we are ever to hold a certain proportion of the people to the soil, we must make it possible for them, through educational channels, to obtain a larger knowledge of the soil and its requirements, in order that they may be more successful in its management. I do not wish to be understood as advocating the teaching of agricultural studies in schools for the purpose of making farmers. I do not believe in that principle, but I believe that it is possible for us to introduce

THE STUDY OF NATURAL SCIENCES WITH THEIR APPLICATION

made broadly to the whole problem of living. And as society, made up of all classes in the community, is entirely dependent upon the production of the soil for their existence it is not a question of assisting a class in introducing this line of instruction, but it is in the interest of the entire community. In the very brief time allotted to the discussion this evening we will be obliged to go at once into the subject of

METHODS

how this line of teaching may be carried out in our schools. One county was chosen in New York State in which this work was introduced in the schools for its practical workings. Two classes of schools were selected —the high schools of the towns, and the rural schools of the country districts. Work was introduced upon the principle of University Extension. Subjects were chosen, and university instructors were sent out to the schools to give lectures upon the special topics that were of interest to the children living in the community where this school work was being carried on.

LECTURES WERE GIVEN UPON THE SOIL—

of what it was composed; the elements of plant food which it contained, and how these elements could be most readily obtained to supply the needs of the plants which were grown upon it. Lectures were given upon the growth and development of plants, choosing those that were most familiar and common in the district. For the lower grades, work began with the study of seeds, which were colleced from the most familiar plants in the district, representing the food plants of the garden; of the grains and grasses of the fields, and from these lessons were given in the principles of germination, the seeds being germinated and the study pursued in observation lessons. This proved of great interest to even the smallest children in the primary grades. In the more advanced grades, subjects were chosen in plant study that were of commercial importance. The question was frequently asked if the children in the rural schools take any special interest in the study of plants, and, in order to test the children upon this point, the strawberry plant was chosen as a special subject in the lessons given before the schools, and, at the conclusion of each lecture the children were notified that if they would be interested in the further study, upon their application being sent in to me in the following spring, they would receive one-half dozen strawberry plants; and

THEIR OBLIGATION WAS TO SET OUT THE PLANTS,

care for them, study and learn all they could about them, with the further obligation imposed that they should write an essay or a composition upon what they had learned about these plants, and give it to the teacher of their school. This, perhaps, was the severest test that could be given to children, for if there is one thing that a boy or girl dislikes it is to have to write a composition. It was, however, very surprising in the following spring of 1896 to find applications coming in in great numbers from these school children from Westchester county, where this instruction had been given. The notice of the offer had been published in the New York City papers, and the children from the graded schools in New York, many of them reading the notice, supposed they were included, and many of these city children made application for the strawberry plants. The local papers throughout the state also copied the notice from the city papers, and school children and teachers from all parts of the state began to make application for the strawberry plants, and over 15,000 plants were sent out to school children in the state for the purpose of study. I have several hundred very interesting letters, and some compositions,

that were afterward sent me by these children and the teachers of many of the schools in the State. There was no failure in any instance of exceedingly lively interest on the part of the children, and also the teachers, in this work, as it was introduced in the schools.

One of the first problems which presents itself to us is that of the teachers—everywhere they feel themselves not competent to take up this work, for the reason that they have had no training in this direction, and under these conditions the very important question arises, how can we practically introduce this very desirable instruction? Let us consider

WHAT NATURE STUDY MEANS.

It does not mean confining ourselves to books—its very name indicates that we shall go away from books, and to nature herself, and this is the solution of that problem which seems so difficult in this direction. At present it would be undesirable to attempt to introduce natural science teaching as a regular part of the school curriculum, because our curriculum is altogether too full at the present time. Our present system of education is most superior in its methods, but if there is one criticism to be pronounced upon it it is that it is exacting and demanding too much work to be done in a given time. Teachers are distressed and worried over the subject of examinations; while the boys and girls in our schools are suffering from undue anxiety over the question of markings, and the possibility of their passing up in their grade work. There is without question of doubt too much time given to study, and the physical conditions which exist today with the young people in our schools—a condition of over-strain and nervousness, which in many instances results in prostration—call for our consideration of the necessity of changing somewhat our present school curriculum. The nature study should come in at this point as a change—a relief—in the over-taxing, exacting work, that is required from our school children at the present time. We can well afford to drop out for a fifteen or twenty minute period, two or three times a week, some regular exercise, and substitute in its place the study of the soil, the study of a plant, or of an insect, or of a domestic animal, and for a time close the books absolutely. The subjects are innumerable for this work, as the objects in nature are so varying and so great all about us.

It will be necessary for the teacher in choosing this work to arrange subjects and obtain some information in order that they may be properly presented during this exercise; and for this purpose Cornell University, to whom the work of the New York committee was assigned, is now issuing teachers' leaflets treating subjects, in outline and very briefly, as helps and aids to teachers in presenting this work to their schools. Your Agricultural College in Michigan can do some of its most valuable work to the State in co-operating with your Department of Public Instruction, and, through its scientific instructors, furnish subjects, prepared in outline, touching the great interests of your State along its line of agriculture and horticulture, which would be of invaluable aid to teachers in carrying this work into the schools of your State. Comparatively few can avail themselves of the advantage of college, but at this point

THE COLLEGE CAN GO OUT TO THE PEOPLE.

The function of the college is to prepare teachers, and there is no field more valuable than this that the trained teachers of the college may go out and in tachers' institutes, and in public schools to some extent, meet the patrons and the children, and help them along this line of instruction. The benefits that shall come from the introduction of studies of this nature touching the great industrial interests of this country can not be measured.

When we come to apply the advantages which education will give to those who attempt the management of the soil, there will come to them the same benefits which have come to the trained men in professional work, and it is for this reason that our agriculture is suffering today. At a time when the profits have been growing less and less, the difficulties of production have materially increased, through wonderful multiplication of insects and fungus development which has inpaired the ability of farmers in point of prosperity in their business. They have never had education or training to equip them to successfully cope with these difficulties, with the result that they are overwhelmed and overborne by the losses which come to them from various causes which they have not ability or training to meet. To illustrate directly

HOW THIS WORK MAY BE INTRODUCED

into our schools, we will choose one subject—the apple. Here are two specimens to be brought before the school—one beautiful and perfect, and the other imperfect, and ruined in its value. The two samples are presented to the class—they are called upon to choose which one they would take if they had the opportunity—always choosing the perfect fruit, of course. The reason is asked why the other apple is not chosen—then comes forth a volley of answers that it is poor, that it is unattractive, that it is wormy; and when the last reason is given then the vital part of the subject is reached. What has caused this defective specimen and destroyed its value? The history then is taken up of the codling moth—what it is, where it comes from, and how it gets in its destructive work; and as this life history is briefly given then the instruction should be carried a little farther, as to how it may be controlled. The damage that comes from this one little insect in New York state to the apples and pears will aggregate, annually, three millions of dollars, and it is possible, through the agency of our public schools, to disseminate information that shall reduce this loss certainly more than fifty per cent. This not only interests the children in the public schools, but, as the subject touches the very life existence of their parents, who are depending upon orchards as their great source of income, it will appeal to them in the strongest manner as a work of instruction that has great value to them; and hence the objection that the farmers would not accept this line of instruction in our public schools will be effectually met at this point. In the experimental stage of this work in Westchester county, in New York, there were many farmers who came to listen to these lectures, and they were quickly convinced of the great value which it would be to their children. I would not confine this line of instruction to our rural schools, but I would

CARRY IT INTO THE CITY SCHOOLS,

as well; and while nature study is most admirably taught at present in very many of our city schools I would carry the application of the work ever farther and apply it to the conditions of life in the country, that many children who are living in cities, with no means of obtaining information concerning life outside of the city, may, through nature study instruction, obtain some knowledge of life that exists outside of the city in which they live. I believe

THE FUTURE PROMISES GREATER THINGS IN COUNTRY LIVING,

and in the development of agriculture, than anything we have yet known in our country, but it will come as the result of our educational forces fitting, training and educating the present and future generations along these lines that will enable them to more intelligent and skillful cultivaters of the soil, when a certain proportion of those now in our public schools shall find themselves following farm life as their chosen occupation. One of the most hopeful indications of the present times is the wonderful interest that is awakening in this subject, not only in New York and in Michigan, but in many of the states of our Union. The great problems that are before our Nation today are going to be solved in the future, as they have been in the past, by our public schools, which have been the pride and the strength of our Nation.

DISCUSSION.

EX-COMMISSIONER A. G. RANDALL, CALHOUN COUNTY.

Speaking from the standpoint of the farmer, of the man who is somewhat distant from the city, the question arises whether the people are ready for this kind of teaching. The children of the cities are ready for it because of its novelty. It would not so much impress country children who have associated with some of the objects used in the lessons from their earliest recollection. This may partly account for the fact that the rural schools rather incline to frown down anything like a "fad" of this kind; the value of which is admitted by teachers and thinkers, but not appreciated by many farmers.

The country people must therefore be educated in these matters in every possible way. They must be discussed at farmers' meetings and teachers' institutes. A slight progress can be noted in the matter of nature study, although at present not five per cent of the pupils in Calhoun county are taking up this topic. How is farther advance to be brought about? By following the scheme laid out by the Superintendent of Public Instruction. The common graded schools have been criticized because boys and girls graduate at fourteen years. Twenty per cent of them go on to high schools, but it is certainly to be hoped that this work in agriculture will supplement the work in the common branches of the graded school and thus help cure its defects.

The grave difficulty in the whole matter is the impossibility of getting teachers properly qualified. These we must have before nature studies or agriculture can be successfully taught in our public schools.

THE MOTHER AND THE SCHOOL.

MRS. MARY A. MAYO, BATTLE CREEK.

The place where a woman should be best known is her home. The place where she should be next best known is the school-room. Over

against every home stands the school house. And how soon do the little feet find their way from the home, where nothing but tender mother-love has guided and shielded, to the care and guidance of a person hired for that purpose! In this State a child of five may attend school, and all from eight to thirteen must, at least a portion of the year, or be taught by some competent person outside of the school room. What true mother does not feel a sinking at the heart when, for the first time the child sets its face toward the school house?

ONE OF THE VERY FIRST DUTIES

of a mother to the school, if not the first, is to keep her babies at home. Think of sending a child of five to school—to our common schools! The mother who does this is defrauding her child of the sweetest, truest part of its life, that of just living and growing, watching wonder-eyed the various forms of nature with which it comes in contact; asking questions, making investigations, learning as only little children learn, with a beautiful trust that only comes to little children and saints. The mother is also defrauding herself, robbing herself of the sweetest phase of motherhood—that of directing the young, pure life and helping it to solve the most wonderful mysteries that will ever come into its life. And not only that, but she imposes upon the teacher and upon the school.

Said a very solicitous grandmother who felt sure that the little grandson of five ought to be going to school: "In my day children were sent to school, and his father went the summer before he was five. He ought to be learning something, and not be around under your feet. I do not suppose he knows his letters yet." "No, mother; he does not know his letters, but he is getting acquainted with his father and mother and we are getting acquainted with him. He is learning to know his little brother and sister; to know his home, the birds, the flowers, the animals, the insects. Their is plenty of time for him after he is seven to go to school, and I am sure should I send that restless, active, irrepressible child to school it would be almost an insult to the teacher. And as for his being under foot—my children are never in my way—never too near to me—I want them close—I want to study them, and what is more, I expect to hold them close as long as they live.

THE NEXT DUTY IS TO PREPARE THE CHILD

for the school. School life to the child is a new life—it is a new world to him. For the first time in his life he comes in contact with his fellows, some pure and some impure. Shall the child be sent without any fortification, without any help from mother? Shall the fallow ground of his nature be left bare of any seed sowing until he comes in contact with the tares of vice? It is much easier to plant good seed and have the ground covered with clean pure thoughts of that which is highest and holiest, than to attempt to take out tares after they are sown. The next thought comes as to

THE ATMOSPHERE OF THE SCHOOL

and its surroundings. Surely you say you would not have mothers interest themselves in that which laws effect? How frequently is it a fact

that the provisions of the law do not effect. But, with all credit to the law, superintendent and commissioners, it is a mother's duty not only to her child, but to that other woman's child to see that the law relative to the care and condition of the school buildings is enforced—the easiest of things to do. When we remember that 80 per cent of all the knowledge a child receives comes through its eyes, let the mother be sure that there is nothing surrounding the school that shall leave upon the memory of her child or any other child such a picture as shall bring ever to its cheek a blush of shame.

And not only this, but there are other things that claim the mother's attention. Scientists and physiologists are telling us today that the pictures upon which a child's eyes rest should only convey thoughts of beauty; that the tints and colors of wall or paper should be of most delicate shade and harmony, and that only soft tones and gentle words should fall upon the sensitive ear of a child.

MOTHERS, HOW ABOUT YOUR TEACHER?

Do you know her? Not merely as a casual acquaintance, occasionally met in society; do you know her as the teacher of your child; a co-worker with God and you? This teacher will have the care of your child for ten months of the year and the major part of the hours of the day. Occasional visits to the school are not as a general thing very satisfactory to either parent or teacher. The relation must be closer than that. The best interests of the child demand it; the usefulness and success of the teacher demand it. Can yau conceive all that may be done for your child by close, intimate and friendly relations with the teacher? And knowing this, dare you withhold yourself and your influence?

Up to the time of attendance at school you have been almost the sole guide of your child; are you now willing to trust not only the mental, but the moral development of your child in the hands of an almost entire stranger, and that without a word of counsel, advice or tender solicitude on your part toward that teacher? Let them accept the charge of your tender, sensitive child, or the forward, irrepressible, ambitious one—each needing the most careful and judicious management.

We know these teachers are longing for the helpfulness that only mothers can give. Said a teacher but a short time ago: "That boy is a puzzle to me. I wish I knew his mother, his home and his surroundings. If I did I think I could better understand and help the boy. I have met her, invited her to visit the school, asked a few questions about her boy, but she seemed so indifferent that all attempts to enlist her interest in the care of her child were very unsatisfactory." Many mothers evince but little thought in the training and teaching of their children at school, and very frequently they are only sent because of a compulsory law.

THESE ARE THE IGNORANT MOTHERS.

Some times mothers of a foreign birth. And yet remember that just here the mother who is anxious for the best good of the commonwealth must have a care over these mothers' children. This is a trust laid upon you. It is not only for the sake of your child, but for the sake of that other child, who, perhaps more than yours, needs the wiser training and the larger growth.

We believe that mothers, with their profound interest in the child, should take the initiative in establishing cordial, intimate, and helpful relations with the teachers. We think we are on the eve of a revolution. Did we say eve? The day has dawned and that not only in thought, but in very deed.

Quoting from the Outlook of July 10, '97, we find that the mothers of Denver are giving definite assistance in school work.

A COUNCIL OF MOTHERS

was called and the question asked: Are you satisfied with the manner in which your children are spending their time at school? They were not. While they were satisfied with the teacher as an individual, they felt that they needed the very best and constant instruction by experts in all kinds of educational work. They were sure that better work could be done in smaller classes, which would lead to grouping and individual work. That mental work should be condensed and co-ordinated, giving more time for physical, manual, and mental work. And that the ethical should be better, broader, and more definite. When they were sure of the needs of the school room they were led to studying and investigating school reports of this and other countries. Teachers were invited to meet them in their homes, and at their clubs. At last they made bold to suggest a mothers' meeting to be held in one of the school rooms after school. This was their first effective work. Articles were not only read, but studied from such authors as Henderson, Rice, Hyde, and Barnes. These articles were discussed, and that with great profit. Their work up to this time is but fragmentary. The mothers have learned their own deficiencies in regard to school work, and this is a long step toward material helpfulness. The old marking system which generally develops an undesirable rivalry among pupils is being done away with and the tendency toward individual work, in which the pupil is judged by his effort as well as his attainment, is taking its place.

They say they are working for a cultured heart, an educated mind and a well kept body. We think

INDUSTRIAL WORK MUST COME IN FOR ITS SHARE

so there may be skilled hands and trained eyes as well as trained thought —thought must resolve itself into deeds. There is a large class in our school rooms today to whom and for whom industrial training is their only salvation. They come largely, but not solely from a class who for generations have been untrained as to thought, study or any mental culture. And when they attempt class work with others they are at a loss and a sad loss. One great demand today is for skilled workmen in house, shop, forge and field. We suffer keenly today from the lack of skilled labor. Mothers, can you for a moment question your relation to this momentus question? Through these mothers' and teachers' meetings not only the individual, but the homes of the present and the future, the well-being of society, the strength, honor and purity of this nation may be influenced.

In the prescribed course of study mothers should certainly have a voice. A mother says largely what her child shall wear and how it shall be

made. She cares for its food, and should see that it is sufficient in quantity and quality. The condition of the physical is almost entirely supervised by the mother, and whatever the factor that shall be used, in its general and moral development, there should the counsel and advice of intelligent mothers be. Some one asks if this would not interfere with the duties of the Board. Who are the Board? Your servants. Through the power of the ballot you have chosen them; now give them your wishes as to how the work should be done. They should know that only the best interests of the children are in mind, and that only after mature thought and study and wise deliberation on the part of the mothers.

We have been pained at

THE PHYSICAL RESULTS

of a course in many of our high schools. Instead of graduating with a strong vigorous body, it is wasted, worn and nervous. The mind frequently has been crowded to its utmost and the body has suffered, and frequently will suffer for years to come. Is this wise; is it best? Can we mothers set supinely by and only lament the facts as they exist, when we feel that the health of our children is being destroyed, perhaps never to be regained? We trust we may not be thought straining a point when we say we believe that much of the breaking down of our youth while in school may be attributed to the

LACK OF PROPER NUTRITION

in the kind, quality and preparation of its food. When a girl breakfasts from a doughnut and a cup of coffee, or buckwheat cakes and sausage, we cannot feel that the brain or nerves are going to be very well sustained that day; when it dines or lunches from rich cookies, pie, and cake it is not in very good shape to do good mental work. And when from the same kind of cooking it makes a hasty supper and then spends late hours at some social function, it can not be at its best for any demands that may be laid upon it. If every function of the body was well sustained by good body and brain food; when they slept at least nine hours, or better ten out of the twenty-four, we are sure that fewer would break down physically at the close of a course in school or college.

Said a mother, "I can feed a calf and have it do its best, and I can feed a goose to perfection, but I do not know what is the best food for my nervous, frail girl, or for my rapidly growing 14-year-old boy—and both in school." And she strongly emphasized the last clause. It is something few mothers do know, but we believe the next generation will. Would it not be wise for some of us mothers if in our clubs, mothers' meetings, granges, farmers' clubs, and Institutes, the study of foods and their relation to the system be taken up? That domestic science, hygiene and sanitation be subjects under discussion and that text books along this line be studied. Of course to the mothers of today this would be but a smattering, but a half loaf is better than no loaf, particularly if the half is thoroughly digestible (and digested) and made to do its most and best. We believe this a duty we owe our children, our teachers and our schools.

Mrs. Lew Wallace says, "I plead for a childhood of the soul as well as

the body, for the free air, the blessed sunshine, the moderate tasks ended at the school house. It is a sorrowful sound for a child to make at night from a slumber that should be sunny, and a heart beating to healthful music and with checks hot and eyes too bright, to hear it ask with bated breath: 'Do you think I will pass, mamma?.' "

Where are

THE DEAR OLD PLAY GROUNDS

over which you and I romped when we were young? Where we grew and thrived, developed well in mind and limb? They are gone, and in their place we see a nicely kept lawn, and notices posted' "Keep off the grass." The happy valley of childhood is very narrow at its widest. It is there that the limpid waters talk to the singing bird, and the leaves of the trees whisper wonderous tales to the little child. There the years are always golden, and the clouds are but exquisite mountains piled high with flakes of downy whiteness, which the fairies sift down. In this enchanted land of delusions let the little children linger. Do not rob them of their rightful inheritance.

It is only within a few years that women have voted at school elections or that they have had any place on school boards. And while in many states this is now her recognized right before the law, and surely not only a right that she may exercise, but a duty that she should discharge; a duty that she owes not only to her child, but to every other mother's child. We believe that women are eminently fitted for positions on school boards and that without detracting from her motherhood. It is the fact of her motherhood that fits her for the position. A true mother watches over her child each hour, notes its unfolding and developing. She, of all others, best knows its temperament; knows how and what to repress and how and what to bring out and maintain at its fullest, and knowing this in her own children, she is in a large measure fitted to supervise and care for others.

FRIDAY FORENOON.

J. G. Noble, presiding.

QUESTION BOX.

Q. Isn't the cow a creature of habit the same as a man? The more she is housed the more delicate she becomes and susceptible to heat and cold? Isn't comfort a comparative matter, after all?

C. D. Smith: Not entirely. It is too well known to need discussion that a cow is kept warm by the food she eats, and that food so used up cannot go into the production of milk and butter. It is true, however, that cows too closely housed are enervated thereby, weakened constitutionally, and rendered more susceptible to disease and less able to withstand cold. Too careful housing is as bad as too much exposure.

Q. Is black cherry good for fenceposts?

C. D. Smith: Not very—better use cedar.

Q. Has the experiment station tried cow peas, and with what result?

C. D. Smith: Yes. We have not succeeded as well with them as has R. M. Kellogg of Three Rivers, but believe them to be a promising legume for green manure. Try them in a small way—the seed is expensive.

Q. Will a stronger solution of sulphate of copper than 10 gallons of water to one pound of the sulphate injure the tree?

J. N. Stearns: Not if the tree is dormant. It would be too concentrated for foliage.

Mr. Macomb: Are the Wealthy, Stark, and Walbridge apples good fruit and hardy trees to graft on?

J. N. Stearns: The Stark is more so than the Baldwin. For stocks I would use the Spy, Tallman Sweet, or Duchess of Oldenberg.

Q. Why is it that apples grown on young and old apple trees on old soils lack the quality of those grown on new soils?

J. N. Stearns: The quality would not be lacking if the old trees were properly pruned and cared for. The fault may be overbearing or it may be the lack of potash in the old soils that prevents proper maturity of the fruit.

Q. Is there any difference between soft and hard water for copper solution?

J. N. Stearns: No difference.

Q. Will it pay to spray fruit trees late in the fall or early in the spring, with the above solution?

J. N. Stearns: Any time in fall or winter or spring before sap flows, for fungus diseases, will pay.

Q. Will weak copper sulphate solution destroy fungus growth equal to Bordeaux mixture?

J. N. Stearns: I have always used Bordeaux mixture, but will try copper sulphate solution this year, having seen successful experiments with it on the station grounds.

Q. Why should not apple growers and dealers educate the market to preferring good apples to those of little merit except color?

J. N. Stearns: They are doing it at every opportunity. Such varieties alone should be planted now, as people want varieties that have merit, and certainly not the Ben Davis.

Q. Can the Wagner apple be grown on rich lands in this State and carried to cold storage with a good profit?

J. N. Stearns: The Wagner does not carry in cold storage and will bear itself to death in a few years unless thinned properly. It is therefore not a bad plan to set apple trees forty feet apart with Wagners between them, since the latter will be dead and out of the way before the other varieties are in full bearing.

Q. Does tapping maple trees tend to kill them?

Jas. Dunn: I have seen trees than have been tapped for fifty years that are still seemingly sound.

N. E. York, Tuscola Co.: Trees tapped for the past thirty years are still thrifty.

C. E. Mills: I have made maple sugar for the past thirty years. Bore a small hole in the tree not over three-eighths of an inch in diameter. Don't bore deep. Use a record spile to keep the tree closed tight and prevent the entrance of air.

CATTLE FEEDING IN MICHIGAN.

HON. WM. BALL, LIVINGSTON COUNTY.

Mr. Jason Woodman, who was to have presented this topic, was unable to be present, and Mr. Ball consented to open the subject.

Successful cattle feeding, like the feeding of other domestic animals, depends largely upon the kind of animals fed. The best results cannot be obtained in feeding inferior animals, even if all the requirements for successful feeding have been complied with. Breeding and feeding, with proper care, go hand in hand, and in my opinion one is as essential as the other. What I may say will be mainly from the standpoint of the breeder who breeds and feeds his own cattle, which course, as a rule, is the best for the general farmer or one who is engaged in mixed husbandry.

To begin with, the farmer's cows (if the best results are to be obtained) should be

AT LEAST HIGH GRADES.

The males in all cases should be thoroughbred and of the breed desired by the farmer to accomplish his object. If beef is the object of the breeding and feeding, then the male may be a Hereford, a Polled Angus, or a Shorthorn. If good dairy cows as well as cows for beef are desired I should want a male Shorthorn. The practical way of feeding the calves for beef purposes would be (as my experience has proved to my satisfaction) to feed the calves new milk for three or four weeks, then commence with skim milk once a day for a few days, and finally feed skim milk entirely, giving about a common milk pan full three times per day, allowing the calf to have access to some good hay, and adding once or twice a day a feeding of oats and wheat bran. Continue this system until the calf is eight or nine months old, when it should be weaned gradually and some other food given, so that the growth should be advanced as rapidly as consistent with the health and constitution of the animal until it is fit for market, which should be not older than thirty months of age. It has been satisfactorily demonstrated that it costs considerably more to make a pound of gain after an animal is over two years old then previous to that age. The aim then should be to

MAKE AS MANY POUNDS OF GAIN

as possible in the shortest period of time. Believing as I do in the general or dual purpose cow, I would prefer to have the calves dropped late in the fall or early winter. The calves when two years old would be in a position to take advantage of good markets and the butter taken from the milk fed to the calves would bring a better price than in summer—a gain in two directions. In the matter of dual purpose cows, I do not claim that the highest excellence can be obtained in two partially different directions, but I do claim and know that high excellence can be and is being obtained both as to beef production and dairy products in the same animal. Hence such cattle are the most profitable for the general farmer. In feeding the kind of calves spoken of for beef, the farmer should feed in the main what his farm can or is producing.

The calves after being weaned (if fall calves) should have good pasture through the summer and corn fodder or some grain if pastures get short, increasing the grain if necessary until put up for winter. Then good hay and stalks should be fed, with as much corn-meal ground, cob and all or some wheat bran mixed with the meal, as the cattle will eat, until sold.

ROOTS ARE EXCELLENT

as a supplemntary food, and can be fed with a profit. The grain fed the first year and one half should be such as will stimulate muscle and growth and may consist of oats and wheat-bran, with some corn-meal, roots, or ensilage if the farmer has a silo.

The main question to be considered is the greatest amount of growth in the shortest period of time and the best possible condition for market when two years or a little more of age. From a pecuniary point of view the foods given should all be grown upon the farm. Then whatever is received from the sale of the cattle is a sale of the products of the farm

in a manufactured form and must necessarily be more profitable among small farmers than if they had bought the stock fed and chanced the markets at both ends of the deals.

To make the most profit from the cattle under consideration the cows should be

FED WITH THE SAME INTELLIGENCE

and care that the specialist feeds his dairy cows, quantity and quality of milk considered, without much outlay for feed which the farm does not produce. Wheat bran, clover hay, cornstalks, oats and corn-meal, roots, or ensilage, are considered the best food for dairy purposes when fed in proper portions; and by changing the proportions the best results are obtained in the production of beef. The heifers designed for the breeding herd should be selected from the best products at the pail, if their produce when fed for beef has proved themselves of the right sort. They should be fed those foods which stimulate growth and muscle rather than fat producing food. The intelligent farmer will know what food is best calculated to produce the objects sought and feed accordingly. For growth and muscle clover hay, cornstalks, good pasture, oats, bran and roots, with a little corn-meal. For flesh the same coarse feeds with more corn-meal and less of the lighter sorts.

In what I have said I have tried to state in a plain manner what I believe to be the practical course for a majority of the farmers in Michigan to follow. I have used no technical terms in mentioning the foods to use, have said nothing about balanced rations (which to specialists in any direction are necessary) but have used the terms which a majority of farmers use and will continue to use because they are easily understood and are practical. Among the important needs of the farm, both as to fertility and profit, is an increase in the number and an improvement in the quality of the cattle bred and fed. If a farmer has not the most profitable class of cows he should see to it that he shall start at once to remedy the defects by the use of proper males, which should be of the sort for the improvement he wishes to make, remembering that good care and judicious feeding are as essential to improvement as breeding. Two cattle well fed are worth more than three head poorly fed.

DISCUSSION.

Mr. Gilbert, Huron Co.: I have charge of a large farm upon which three years ago I built a silo, hoping to cheapen the cost of growing steers. The method has now been followed two years. Last year a few feeders were bought and put in in November, when they weighed 1,037 pounds each. They were fed 63 days on silage, bran and meal. They were then sold in Buffalo, where they weighed 1,173 pounds. Silage is the proper form in which to feed the corn crop, whether the herd be large or small. When fattening cattle are taken into the barn from pasture in the fall, and put on dry feed, there is always a space of thirty days or more during which they do not gain. This is not so when silage is fed. They gain right along from the start.

This winter I have finished fifty steers and have fifty more yet to finish. Our silo has 280 tons capacity, which will last until April first. Heretofore we had not been able to gain enough to compete with finished steers. We could not therefore get the top prices. The silo obviates this difficulty and shows us that the true economy consists in keeping the corn in the succulent state for steer feeding.

The cost of putting the corn in the silo may be kept low if the work is properly

planned. Have everything ready when the corn is right. Have the men so placed as to economize time and keep everything moving systematically.

C. C. Lillie: This steer feeding is out of my line. I do not feel that I can afford to feed steers when the amount of feed required to produce a pound of beef would yield a pound of butter.

Mr. Gilbert: I can carry one-half more cattle on the same farm with the silo than without.

Q. What per cent is lost by leaving the corn in the field?

C. C. Lillie: The necessary loss in the silo is but eight to ten per cent. The losses in the field run from 20 to 25 per cent.

Q. Does it not cost less to haul in the corn in the winter than to put in the silo?

Mr. ———: No. I would put in the silo every time. Silage is all ready to feed at any time, whether it rains or shines and whether the fields be muddy or otherwise. I have seen times when it was hard work to get it from the field. In the midst of a long thaw the wagons go in to the hub and then when it freezes the corn is fast to the ground. In hard freezing weather after a thaw a man necessarily leaves a large share of the corn in the field when he attempts to haul it to the barn.

C. C. Lillie: As to my statement comparing the food cost of beef and butter, I can not say from actual experience with careful weighing of feed and of animals that the food taken to produce a pound of beef will make a pound of butter; but I have fed steers and afterwards cows in the same barn, and I am fully satisfied that I can produce a pound of butter as cheaply as a pound of beef.

C. D. Smith: It is admitted on all sides that the silo is now a very valuable adjunct to the dairy—almost a necessity, in fact. When it comes to steer feeding the superiority of the silo over dry feeding is not so apparent or generally believed. Admitting that the wastes by weather and drying out are much greater in the field curing process than in the silo, the cost of manipulation, the human labor involved is much less in the field curing process. There are many situations in which the farmer can better afford the extra losses of cheap fodder than attempt to hire the necessary help at corn cutting time. When sugar beets become a common crop it will be difficult indeed to get the necessary help at the silo filling season. Let us take, therefore, a conservative and common sense view of the situation and not get exaggerated ideas on either side.

A. M. Welch, Ionia Co.: I have tried both sides of this question, having on a certain year forty acres of corn in the silo and forty acres outside. Here is my account of the cost of an acre of corn:

COST OF ONE ACRE OF CORN.

Plowing	$1 00	
Fitting	50	
Planting	25	
Cultivating	1 00	
Seed	20	
Total cost	$2 95	
It requires 8 men and 2 teams 1 day to cut 3 acres, or $12.15	$4 05	per acre.
Total cost in silo	$7 00	

If it yields 15 tons per acre we have 46 cents as the cost of one ton of silage in the silo.

This corn would go certainly 100 bushels of ears per acre, or 50 bushels of shelled corn. There would therefore be 2,800 pounds of corn in 15 tons. If a cow is fed 50 pounds of silage per day, the 15 tons would last her 750 days. Dividing the 2,800 pounds of corn by 750 we have 3.7 pounds of corn as the amount of grain the cow receives in her silage. As a matter of fact my cows receive much less silage than is here stated.

The time to cut corn for silage is when it is fully glazed and contains the greatest quantity of protein and sugar and starch. My ration is as follows:

Gluten feed, 4 pounds.
Bran, 4 pounds.
Cornmeal, 6 pounds.
Cornstover, 10 pounds.
Silage, 30 pounds.

This has a total cost per day of 10.75 cents. The cows give from 12 to 20 pounds of milk. Including the young stock and bulls the ration per animal per day costs five cents. I feed silage when the cows are on grass. I cannot afford to do without it.

L. D. Watkins: There is more nonsense per square inch in this silo business than in any other fad that has struck the farmers in late years. On Fairview farm in 1898 I had an unusually large crop of corn, larger than I could properly handle. In my method of handling large areas of corn and feeding large herds of steers, one man feeds 100 steers in temporary shelters divided into blocks of 20. There is waste of neither fodder nor grain, nor is there waste either of time and money getting the corn into the silo. I like to have the animals in the feed lots beautiful, and hence have no use for a scrawny, high type, dairy cow.

Mr. Mitchell: If we take corn at the proper stages and could feed it then, we would utilize all its feeding value. This we cannot do. How shall we preserve it to lose least? Certainly in the silo.

A. M. Welch: Note the difference in the time required to feed dry forage and silage. In my barn one man fed the whole herd silage in eight minutes by the watch.

Geo. B. Horton: In my resolution yesterday asking for the re-enactment of an anti-color law I had no special bill in mind. I now move that the resolution passed yesterday shall refer to the bill introduced by Senator Wagar and known as the Wagar bill.

Carried unanimously.

THE FARMERS' DEFENSIVE MOVEMENT.

A. B. COOK, SHIAWASSEE COUNTY.

It has been well and truly said that God helps those who help themselves. From the foundation of the world the creatures of earth have been engaged in a ceaseless, selfish struggle for existence.

In the minds of the lower animals a full stomach has constituted true felicity. But with the advent of man with his innate desire for advancement, views of life have broadened. The typical man of this eve of the twentieth century, after he has provided for the wants of the body, has other cravings to satisfy.

Education is now regarded with universal favor and is essential to the highest enjoyment of life's privileges. Society in some is also a very necessary attribute of life. Society with some consists of gathering in large halls, the gentlemen attired in claw-hammer suits, the ladies in gowns made conspicuous by a greater or less degree of absence. Amid these surroundings a large amount of time is trifled away enjoying the privileges of polite society, so-called. Others are in society when at the card or billiard table; others at the saloon. The influence of this kind of society may well be questioned. I believe that it is the fact of an early life spent away from these forms of society with the irregular habits necessarily entailed which has given the farmer's boy the sturdy body and clear, vigorous mind which has made him a leader in every walk of life. Social intercourse is highly essential in developing a well rounded manhood, but it should be and can be secured at a very small sacrifice of nervous energy.

As our civilization has advanced we have developed innumerable conveniences which enable us to enjoy life more fully and to give more time to the enjoyment of the higher privileges of life and less to merely accumulating the necessities of life. As an example, I would mention our

mail system, by means of which some citizens have delivered at their doors and others at the postoffice, the periodicals of the day which keep us in such close touch with the outside world.

TAXES.

A higher civilization, like all other good things, has a price; and it may be a pertinent question, "who pays the freight?" Theoretically every citizen should pay a share of the public expenses in exact proportion to the value of his possessions. In practice I am forced to believe that all do not pay their just share. Taxes are as sure as death and should be distributed with equal impartiality. Are they? It becomes my duty each year to pay taxes upon city and country property. Upon the city property I pay upon a one-fourth valuation. That is lots which cost two hundred, whose regular market price is two hundred, and which are continually changing hands at that price, are assessed at fifty dollars, while some country property, located in the same county, with no improvements whatever, is assessed at thirty dollars per acre, a very fair selling price for the same.

In some of our cities it is quite the fashion to offer a suspension of taxes for a term of years as an inducement for manufacturers to come to that town. This is, it seems to me, rank injustice.

It is an undisputed fact that a number of our strongest corporations practically escape taxation altogether. It is said that should they come up to the rack and pay as others are required to, that they would be forced to suspend. We have only their word for this, and I very much question their veracity. If, however, they cannot; let them do as any farmer would be forced to under similar circumstances and let some better manager or cheaper method supersede them.

I am absolutely sure that the farmers of Michigan want only justice. We are entirely willing to contribute our just proportion of the expenses of State, county and municipality, but we do insist that all classes of citizens contribute equally. At the outset I mentioned

EDUCATION.

In this matter it seems to me that we farmers of Michigan have good grounds for self congratulation. Our primary schools are in our own hands. Our Agricultural College is acknowledged to be one of the very best of its kind and is doing a mighty work for the class it represents. It is our College and we should give it our support. Let us hope the present legislature will be liberal in its dealings with the Michigan Agricultural College.

In matters aside from education I feel that many of us do not enjoy the privileges to which we are entitled. I believe that as a class we do not exert the influence that we should and that other classes of citizens of less numbers and infinitely less importance commercially are more powerful in influence than we. The reason is obvious. While other lines of business have been cementing their interests by means of unions, trusts, and corporations, and adopting as their watchword co-operation, we have in a large measure stood apart, each conducting an individual defensive movement. In this we are many, many years behind the times.

I will not take your time in discussing the wonders achieved by unions,

trusts, etc. The results of these colossal mutual benefit institutions are too much in evidence to require any thing but a passing mention. Nor will I discuss the moral side of the question, but the condition that confronts us is that every other class is co-operative for their own financial benefit, and if we are going to keep pace with them we must pit combination against combination. When we see every other business and profession solidly united in combines can we as farmers hope to be able to compete with them on even ground unless we tie our interests in a common union?

To a certain extent this has been done. We have in Michigan two organizations which are working along this line. The grange, the older of the two, has accomplished much and is deserving of most earnest support. I know very little of its workings, as we have no active grange in our vicinity, but I do know that it has been a power for good in many rural communities and that its power has been felt in both State and national legislation.

The second form of farmers' organizations are our Farmers' Clubs, which are of comparatively recent origin, very few clubs in the State being over a dozen years old. The last five years has witnessed the formation of over three hundred Farmers' Clubs in this State and all without one cent paid to organizers. This it seems to me is a remarkable showing and augurs well for the future of the club movement. While we find a great variety of methods of conducting club meetings I will briefly describe

A TYPICAL MICHIGAN FARMERS' CLUB.

It consists of twenty families situated within easy driving distance of each other. Meetings are held once each month in the home of a member, each entertaining in turn. The summer meetings are held in the afternoon, the winter meetings all day or from ten until about four. The dinner or supper, as the case may be, is in a majority of the clubs provided entirely by the hostess. A program is presented which is of practical value and recitations, readings and music serve to enlighten and enliven and appeal more strongly to the young, for the club is most emphatically a family affair where all are at home from the prattling babe to the grey haired grandsire. A considerable portion of the time is taken up in a purely social way.

In a number of counties, County Associations of clubs have been formed, which serve as an intermediate step between the clubs and the State Association of Farmers' Clubs.

The State Association was organized with the object of bringing the isolated clubs all into close relation, and to render united action possible. This object has been secured.

The "Michigan Farmer" has been a highly important factor in this movement, and had it not been for its club department so ably edited, the results of the last few years could never have been secured.

That is what the clubs are. As to results, much knowledge of a practical nature is secured in the interchange of experience, and ideas as well as in the discussion of desired legislation, existing abuses, and needed reforms. A grand social time is enjoyed, resulting in the strengthening of old friendships and the formation of new, a mutual confidence and re-

gard is engendered, a social instinct and polish is inculcated and all without one minute taken from needed sleep or a minute in the presence of evil temptations.

Lastly, a mighty impetus is given toward united action which is so essential, yet which in the past has been so fatally lacking in rural affairs.

The Farmers' Clubs have proved their adaptability to Michigan soil and I believe that the progress of the last few years will continue.

Between the grange and the clubs the closest relation possible should exist. The interests of one are the interests of both. In matters of legislation a joint committee would be more effective than two independent committees. A joint recommendation from the clubs and grange would now represent very fairly the sentiment of the best element among Michigan's farmers. When Granges and Clubs become so numerous that their voice will be recognized and accepted as

THE VOICE OF THE RURAL CLASSES,

when we can rise as one man and make specific demands, our voice will be heard.

When this day comes our present taxation laws will be revised and the revised laws will be properly enforced. Many advantages now peculiar to the city will be ours. Equity and economy will replace injustice and extravagance. In short the Michigan Agriculturist will have come to his own. May God speed the day when we as farmers actively adopt as ours our national motto: E Pluribus Unum!

FRIDAY AFTERNOON.

Wm. Ball, presiding.

QUESTION BOX.

Burt Tyack, Troy: Why do large woody bunches appear on the roots of red raspberries?-

W. L. Dean: They are root galls. The plants so affected should be dug up and burned.

Q. Is it best for a dairyman to raise his cows or buy them?

C. D. Smith: It depends altogether on his surroundings. Generally it pays better to raise the calves from your best cows. Your herd will then steadily improve if you use thoroughbred bulls.

Q. What does it cost at the Experiment Station to produce a pound of beef?

H. W. Mumford: It depends on the age of the steer, young steers costing one-half as much as two-year-olds; and on the cost of the feed.

Q. What shall we do with the sparrow?

Ans. Kill him.

Q. How much protein is there in coarse middlings? Is it a good feed for cows and calves?

C. D. Smith: Middlings contain usually about 15 to 16 per cent of total protein. They are an excellent feed for calves and for cows too, but for the latter are inferior to wheat bran.

Q. What use is made of the tons of unpalatable butter made in unsanitary surroundings and sold in local stores?

C. D. Smith: Part of it goes to establishments where it is reworked, rewashed, and resalted and recolored to a uniform product, and is then sold as imitation creamery. The next worse grade goes to establishments where it is melted and treated with something to remove rancidity, and is then put on the market in competition with decent butter. The worst stuff is melted into grease.

Q. Do you drill corn in rows to cultivate one way, or plant in hills?

Wm. Ball: I drill part of my corn and plant the remainder in drills. If the field is reasonably free from weeds it is all right to drill. If the field is weedy, plant in hills.

Q. Would you cultivate corn as soon as a crust forms after a rain?

C. D. Smith: Certainly; the crust allows the water in the soil to escape; therefore break it up as soon after the rain as possible.

Mr. Morse: What is the remedy against selling oleomargarine and process butter for dairy and creamery goods?

C. D. Smith: The best remedy is to furnish a good supply of first class butter and then enforce the laws against fraud.

Q. What is the best variety of medium early potatoes for southern Michigan?

M. L. Dean: Early Michigan, although the Early Andes is also good.

Q. Why is it that the men that are so bitter against the silo are the very men that never owned a silo or put up a pound of silage?

Mr. Ball: I, for one, am not opposed to the silo. I believe it to be a good thing for the dairymen, but not quite so necessary for a steer feeder.

Q. Will not the growing of so many acres of sugar beets tend to flood our state with an undesirable class of foreign labor?

C. D. Smith: I hardly think so. More help will come out from the cities, it is true, but this in itself will be an advantage to both city and country. It will get the people in the crowded parts of the cities to look to the country for this and other jobs, which will be a good thing.

Q. What is the best way to get a sand hill seeded to clover? It is now rye stubble.

Mr. York: I would harrow before sowing, but not plow. I would leave the stubble on the ground to hold snow and help protect the young clover.

I. N. Cowdrey: I would sow in August. Would disc up the ground; then follow the sowing with smoothing harrow.

H. G. Ries: What benefit to the farmer is it to do away with township drain commissioner?

F. W. Dunham: In Bay county we have a county commissioner and it does not work well. It depends altogether on whom you get for commissioner.

Q. How about a silo for a farm of 80-100 acres—size, height, planting corn, getting to silo, etc?

C. C. Lillie: Fifteen feet in diameter and not less than twenty feet deep, better thirty feet. Plant corn as for regular grain crop, but somewhat thicker. Use a modern corn harvester, so that men can handle the crop more economically. Get a large cutter to keep the gang of men going.

Q. What is meant by whip grafting?

Prof. Taft: The apple seedling is cut off at the collar and the root cut in lengths of three inches, making two or three out of each seedling. A slanting cut is made about three-quarters of an inch long through the top of the root cutting. A knife is inserted at about the center of this oblique cut and pushed down to make a tongue. The scions are cut in lengths of 3 to 4 inches. The cut on the scion is made by inserting the knife in one side about three-fourths of an inch from the end and thence by a clean cut toward the end, taking off a slice from the side to provide a flat surface for union with the stock. A tongue is cut on the scion similar to the one on the stock, except that the cut for the tongue is made about a quarter of an inch from the end. The scion and stock are joined, being careful to see that the cambium layer or inner portion of the bark on one side at least be in apposition. It is then wrapped with waxed twine to keep in place.

Q. Give habits of apple tree borers and remedies for same.

Prof. Taft: There are two species, round and flat-headed, both larvae of beetles. The eggs are laid in summer after June first on the bark, especially where injured either by frost or by the cultivator. They hatch after a few days and the young worm bores into the sap wood. It takes three years for the borer to mature, during which he is boring in the wood of the apple tree and doing serious injury, often causing the loss of the tree.

The remedies are keeping the tree healthy and free from injury, digging out the young larvae, and finally whitewashing the trunks of the trees near the ground with a whitewash made of hydraulic cement and milk.

Q. What kind of plows and harrow should be used in cultivating an orchard?

Ans. A gang plow is excellent. An Acme harrow for light soil and disc harrow for heavier.

Q. What is the best grain to feed with silage?
C. C. Lillie: Gluten meal, oil meal or cottonseed meal.
Q. What is the best thing to put on a silo after it is filled?
C. C. Lillie: A good way to treat a filled silo is to tramp down the top for several days in succession, putting on plenty of water, and let the top three inches mould for a cover. Others sow oats on top and let them grow.

WOOL IN MICHIGAN.

PROF. HERBERT W. MUMFORD, AGRICULTURAL COLLEGE.

Any farm product which brings to the farmers of Michigan an annual income of a million and a half dollars is certainly of enough importance to demand the thoughtful consideration of every farmer in the State. In the early history of sheep husbandry and wool growing in the United State, Michigan took a prominent position. Even now, taking into consideration the number of acres of farm land in each of the states, Michigan stands second as to the number of sheep to each acre. If we study carefully the wool markets we soon become convinced that Michigan wool is not held in so high esteem as the wools placed on the market from a few other States. Barring the fact that there can never be as great a uniformity in

QUALITY AND CONDITION OF MICHIGAN WOOLS

as is found in some of our western states, there is no reason why Michigan wool growers cannot produce just as good wool as any state in the Union. We do not hesitate to say that the principal factor in the improvement not only in the quality, but in the quantity of wool throughout the United States has been brought about through the agency of the American Merino.

We simply mentioned the fact that Michigan wools along with those of New York, Indiana and Wisconsin are sold on the market for from one to two cents per pound less than the same grades of wool from Ohio, Pennsylvania and West Virginia. If we, as Michigan farmers, live up to our opportunities we should know why this is so, and if a remedy is to be found we should begin its use at once.

We are told that a considerable quantity of our best Michigan wools are sold on the market as Ohio or Pennsylvania wools, but as a large majority of our Michigan wool growers sell their wool to local dealers they do not as a rule get prices which are comparable with the kind of wool they produce. We refer in this statement to the class of wool growers in Michigan who produce our finest grades of wool and are particular about the care of their flocks and the preparation of the wool for market.

Is it to be wondered at that Michigan wools are not sought after in the market when over fifty per cent of the Michigan product is placed on the market without being in the best condition? Of this fifty per cent about fifteen per cent consists of wools so poorly grown that the wool fibers are weak, hence not valuable for manufacturing purposes. Of the washed wools from ten to twelve per cent must be sold as unmerchantable. That means that they must be sold for about the same price that they would have brought had the farmer not taken the trouble and ex-

pense to wash his sheep at all. From four to eight per cent of Michigan wool contains burrs, litter, etc., while of the remainder nineteen per cent. is in a condition which is discriminated against by the buyers. It either contains a large amount of tags or is improperly tied. Generally speaking, our Michigan fleeces are pressed together too snugly in too small a wool box, too much twine is used, and very often a twine very detrimental to the fleece if it becomes incorporated with it.

THE VALUE OF WOOL DEPENDS

upon its condition, its quality, the length and strength of the staple and the amount or per cent it will scour. The condition of the fleece can be easily governed by a little thoughtful attention on the part of the wool grower. There is no excuse for wools going to the market full of burrs, seeds and other litter. All of these foreign substances increase the weight of the fleece, but decrease its value, since it increases to a considerable extent the cost of scouring it and preparing it for the use of the wool manufacturer. The only way the farmer can improve the quality, density, and covering of wool is by careful breeding and selection. You cannot make any more fibers to the square inch by better feeding; you do, however, increase the length of the staple and the amount of yolk in the fleece. To get the best results the fiber of the fleece must grow evenly from the time the sheep is shorn until the fleece is removed again. We might liken the wool fiber to a delicate rod on which is recorded every varying condition of the sheep during the time the fiber remains on the sheep. That fleece of wool is most valuable which has the best quality and length and which scours the least.

GRADING OF WOOL.

We have had considerable to say about the quality of wool. Quality refers to the fineness of the fiber, and to no other consideration. XXX is the finest quality of wool that we have. It is very scarce in the markets at the present time, in fact almost unknown. It is designated sometimes as Picklock. This means that the wool grading as triple X has the smallest fiber of any wool placed on the market. The next lowest grade is two X. The finest samples of our American Merino wool are sometimes graded in this class, but most of our Michigan Merino wool fall into the grade known as X in the market. Coarser wools than X are designated by $\frac{1}{2}$, $\frac{3}{8}$, $\frac{1}{4}$, etc. Wools which are not long enough for combing purposes are designated as clothing wools. With the exception of the Delaine Merinos, the fleeces of most Merino sheep are graded as clothing wools, as also wools coming from the Southdown and a good part of that coming from the Shropshire and Hampshire breeds, and the various crosses between these breeds and the Merino. Wools to be good combing wools must be not only of a certain length, but of good strength. The finest quality of combing wools are Delaines, if we may be permitted to call Delaine wools combing. Delaine fleeces may be graded as fine, medium or low Delaine or in some markets as No. 1, 2 and 3 Delaine. Then come the coarser combing wools designated as $\frac{1}{2}$, $\frac{3}{8}$, $\frac{1}{4}$, coarse and braid combing, braid combing, of course, being a wool possessing the coarsest fiber. Some fleeces of the Lincoln and Cotswold breeds fall into this class of braid combing wools, while specimens of this breed producing wool of

the finer texture are classified in some of the higher grades, along with some of the Dorsets, Shropshire, Hampshire, Oxford and Leicester fleeces.

If we are breeding down sheep that generally grow clothing wools it will be to our interest to make a vigorous attempt to have those sheep produce combing wools, since it will be worth from one to two cents more per pound, providing it is of the same quality as when it graded in the clothing class. We can bring this about by selecting our breeding sheep from those of our flocks known to produce a long staple of wool, we can increase the length of the staple slightly by better methods of feeding, the same methods of feeding which produce a good healthy growth of carcass will at the same time tend to produce a heavier as well as a better fleece of wool, since we shall secure a stronger fiber.

To conclude let me say that if I have said anything which will lead the wool growers of Michigan to more intelligently consider the production of wool in this State and that will tend to

MORE CAREFUL METHODS IN FEEDING AND BREEDING

for wool and preparing the same for market so that our Michigan product may be sought after in the markets I shall be glad. It is dangerous for any man to prophesy the future of the wool industry in the United States; however, we have confidence enough in the business to believe that any pains and reasonable expenditure of money tending toward the improvement of the wool product of our Michigan sheep will be more than repaid in the next few years. To be more definite let me say that in my judgment there will be an increasing demand for finer grades of wool such as the Merino alone produces. We do not wish to infer by this that the production of wool on many of our mutton breeds of sheep cannot still be carried on as a profitable industry of the farm, nor that the breeders of Merino sheep can afford to entirely overlook the value of the carcass of mutton upon which the finer grades of wool are produced.

As you find time, thoughtfully consider whether we as wool growers of Michigan cannot greatly enhance the value of our wool products by first properly growing our wool, seeing to it that the fiber grows evenly from one shearing till the next, and that we place this wool on the market in the best possible condition.

(a) Unwashed. We believe that in the end our wool growers would realize a more satisfactory profit on their wools if the fleeces were sent to market unwashed. We strongly advocate early shearing. We have found from experience with coarse wooled sheep that by shearing about the first of April each year we could get more wool per head than by shearing the last of May or first of June. If the wool is taken off at this time it will be sent to market in better condition ordinarily than if left on the sheep for a longer time. We have found, too, that the market at this season of the year has been very satisfactory.

(b) The wool should be free from burrs, seeds and other litter.

(c) Do not pack the wool into too small a wool box, but make it as bulky as possible for its weight.

(d) Use as little twine as possible to hold the fleece together, and let that twine be small and manufactured from flax. Never use binding twine or sisal for doing up wool.

(e) Place everything that is wool and dry in the fleece discarding tags, and wet locks of wool.

(f) Grow as long a staple as you possibly can without sacrificing quality, density or covering.

(g) Let every farmer of Michigan who is not now a producer of wool get a few sheep and by improved methods of feeding and breeding instruct those who have been longer at the business how they too can do better.

DISCUSSION.

LED BY ROBERT GIBBONS.

Within the past five years Michigan has retrograded fifteen per cent in value of wool produced. We have gone more into the feeding of mutton and consequently less valuable wool. Michigan mutton now sells highest in Buffalo markets of any on the continent. We must hold this high position in the quality and quantity of mutton, and at the same time improve both quantity and quality of our wool product. This presents a difficult problem, but one that can be accomplished.

The great trouble with Michigan wool at the present day is that it is very uneven. A buyer cannot now, as he could formerly, go to a certain locality and find all the wool in that neighborhood alike. Now he has to select his supply of a certain grade from a large amount of wool he does not want. It thus costs a good deal to get wool together, and this cost is lost to the producer. We are now using no system whatever in breeding. The sheep owner uses a ram of one breed one year and of another breed the next. Hence the fleeces found on his farm are not easily graded, are mixed, lack uniformity, and hence bring a lower price.

We can make a great improvement if men in a certain neighborhood would agree on one kind of sheep and all grow that breed. The buyers could then afford to pay more for the wool, as they would know beforehand what kind of wool was grown, and they would not have to travel far and wide to find the wool they want.

Our flocks have also lost in shearing ability from one to one and one-half pounds per fleece on the average. This is due to the indiscriminate mixing of so many breeds. This is a fatal mistake. We are losing qualities in the wool that we need. If a man likes one kind of sheep let him stick to it, for he can succeed much better with it than with some breed he does not like, and there is so great a diversity of breeds now that every man can be suited.

There is no fertilizer, commercial or otherwise, like a flock of sheep. With these animals on it the farm is sure to improve in fertility. There are two harvests besides, one of lambs and the other of wool. After an experience and observation extending over a quarter of a century, I feel safe in saying that there is no class of animals that more quickly and more effectively improve both the farm and the pocket-book than a flock of sheep.

ECONOMICAL SHEEP FEEDING.

A. M. WELCH, IONIA.

Economical sheep feeding is the topic assigned me; had it been profitable sheep feeding I think there would have been more interest in the subject at the present time.

It seems as if there has been a disposition on the part of drovers and commission men and feeders themselves to run the price for feeders so high in the fall that there has been but very little or no profit in feeding any kind of stock, and in many instances there has been a heavy loss. But economical sheep feeding is my subject whether profitable or not.

A few years ago sheep could be fed in

ANY KIND OF HAPHAZARD WAY

and yet be profitable. But times have changed, and sheep feeding as well as everything else has had to change with the times.

A man today to be an economical sheep feeder must understand the habits and characteristics of the sheep. He must be an observing man, quick to perceive any slight change that may take place. For instance, before I left home the first time my lambs were doing very nicely on the ration I had prepared for them, but during my absence the men hauled in some bean pods that were not half thrashed and the feeder gave the sheep the same amount of culled beans as he did when feeding the straw that was thrashed clean. The result was when I got home nearly one-half the lambs were scouring and the man had not noticed anything wrong, when a blind man, if observing, could have noticed something wrong on opening the door in the morning by the scent in the barn. In the next place he must have

A SUITABLE BUILDING.

I do not mean by this that they have got to be elaborate, but they must be so constructed as to be dry, light and well ventilated. They should be so arranged as to be entirely under his control as far as temperature is concerned. Sudden changes are very detrimental to the health of sheep, as they are more susceptible to colds than any other kind of stock. He should have them arranged to be convenient as possible about feeding, so it will not be necessary to employ extra labor in caring for them. As a rule the more conveniently they are arranged the better care they will receive.

I once had a friend come to visit me who was a sheep feeder. He took out his watch and timed myself and man to see how long it took to feed 700 lambs. He said we fed them in just 18 minutes, sweeping the rack and feeding them their ensilage and grain, yet there was no hard work about it.

METHODS OF FEEDING.

The ensilage is wheeled in a cart on the floor directly over the racks, and dropped in holes through the floor made for the purpose. The grain is in granary on second floor, and draws direct to the grain car which hangs on track the same as barn doors run on. This car runs the whole length of the alley which is in center of barn with racks on both sides. The end of the alley is open so we walk into it to spread the ensilage put in what other kind of grain we are feeding. Sheep to be economically fed must have

A VARIETY OF FEEDS.

We feed ensilage, corn, and middlings in the morning; straw, hay or bean pods at noon, and with a few cull beans; the ensilage, with middlings and corn at night. Sheep should always have a sufficient supply of good, pure, clean water, so they can get at it without much trouble. Sheep require as much water as any other kind of stock, and they want it often. Sheep should have a supply of good clean salt before them so they can get it at will, as they are better judges when they need salt than we are, and if kept constantly before them they will not eat to excess.

EARLY CLIPPING.

Sheep or lambs to be fed for the late market should be clipped, the earlier the better, especially our native lambs. For in buying you will always get some that have not been dipped and are covered with ticks. Clipping not only gets rid of the ticks, but the lambs will do much better and will need less room. I have weighed lambs before they were clipped and one week afterwards and found they had gained their fleece of six pounds. I am an advocate of

THE SILO FOR LAMB FEEDING,

starting in with ensilage as almost an entire ration and gradually increasing on grain to finish them. But I always figure to have my ensilage last till the last feed, as they will eat ensilage in warm weather much better than dry feed.

Last season I fed 623 Montana and Utah lambs that weighed in 58 pounds, and weighed out 96 pounds, and clipped 6 pounds of wool, or a gain of nearly 40 pounds per head.

I consider ensilage one of the best feeds for lambs we have on account of its succulence keeping the lambs' digestive organs in shape to take care of the more concentrated feeds.

THE RATION

we are feeding our lambs at present consists of

Ensilage, 2 pounds; corn, 2-5 pound; last feed at night.
First feed in morning—Corn and beans, 36 pounds to 60 lambs, or 6-10 pounds to one lamb, and ½ pound of hay per head, which is changed for a light feed of bean pods twice a week, and a feed of wheat straw at noon.

I place no value on the straw. This ration figuring corn at 40c delivered; hay, $5 per ton; ensilage, 50c per ton or what it costs to grow it and put it in the silo; cull beans same price as corn, which only cost me 30c per bushel delivered; makes this ration cost me a trifle less than 6c per head per week.

The lambs I am feeding on this ration are gaining about 2 pounds per head a week, of making a gain on cost of about 3c per pound. We increased this feed from ensilage alone gradually to the present ration. Lambs weighed in 60 pounds on 27th of November; lambs weighed on 27th of February 82 pounds, or a gain of 22 pounds in 13 weeks.

Understand these lambs all had the scab and had to be dipped when the weather was cold, besides being off feed a week or 10 days, which I have already mentioned.

Last year, besides feeding my 600 western lambs, I fed 400 native lambs and with the years of experience I have had in feeding lambs I have been thoroughly convinced that there is

MORE PROFIT IN FEEDING WESTERN LAMBS

than our Michigan lambs, which are more or less infected with disease. Besides feeding western lambs this year, I am feeding lambs of my own raising, 85 in number, that averaged 85 pounds per head when they went in barn; averaging 120 pounds last Monday.

For profitable feeding these lambs should have been turned off early.

but the price would not admit, so the whole barn will be clipped next week and held until May. I have always found it more profitable to

FEED AND SELL EARLY

than fill in and clip and feed late, but late years it has been impossible to fill the barn the second time without getting hold of too many cull lambs infected with disease, which there is no profit in feeding.

The profit in lamb feeding this year is yet to be determined as far as late feeding is concerned. The early feeders have taken their medicine, and some of them a pretty good dose, too. A friend of mine who sold recently stated that he just got paid for the grain, losing his coarse fodder and hay, and the cost of dipping his lambs. Of course, we are all aware that McKinley is no longer the advance agent of prosperity, for they say prosperity is here with McKinley as manager. But he has had business of more importance to attend to; lambs are 80 cents less than a year ago and $1.20 less than two years ago, and I do sincerely hope that some of you with more influence than I will call his attention to the matter before the first day of June.

The outlook for the sheep business should certainly be encouraging. A few years ago we had 50,000,000 sheep; last year's report showed but 32,000,000, about 2-3 of what we had, and during that time the consumption has increased so that it takes from 12 to 14 million annually to supply the demand which is increasing at from 15 to 20 per cent. And I think that you who are interested in the sheep business, whether for wool or mutton, will agree with me that there is something wrong besides the tariff.

DISCUSSION.

LED BY A. B. COOK, SHIAWASSEE COUNTY.

Although my experience has not been long, it has taught me something about fattening lambs and feeding sheep generally. Sheep and lambs are now very cheap, according to former standards of price, but when all things are considered it is a wonder that the price has held up as well as it has. About Vernon, in Shiawassee county, the lamb feeding industry is rapidly developing, though the farmers are quite disgusted with the results last winter and this one. Many feeders will drop out because of these low prices, hence it is just the time for thinking men to persist in the business.

Mr. Lillie's conclusion that he can make a pound of butter as cheaply as a pound of beef is a peculiar one. Six grade Shorthorn steers gained 100 pounds each per calendar month, or over three pounds per day. The scales were handy and the steers were weighed with sufficient frequency to insure accuracy. The dams were family cows, not particularly beef-bred.

Cows that give two pounds of butter per day and keep up that gait for any length of time are rare and are found among cows specially bred for butter production. Cows that give three pounds of butter per day are not to be found. It is true that these two pounds per day cows may eat less than the steers just referred to, but there is the milking and butter making to be considered.

As to silos, much injustice is done by claiming too much for them. The statements made by Mr. Welch as to the cost of harvesting and putting in the silo seem absurd. On the Cook farm a silo was built several years ago, was filled regularly for a number of years but is not filled now. A silo is a grand good thing, but I cannot afford to fill my silo now.

The statement made by Mr. Welch that his man could feed a herd of 50 cows in eight minutes teaches a wrong practice. Any man that would rush chores in that way ought to be discharged. All cows do not require the same amount of feed,

hence one danger of this rushing. Again, in sheep feeding, quietness is of the utmost consequence. I can go into my flock of lambs and they will not get up. They are quiet and contented. If one of these ranting rushers were to swoop down on a flock of lambs the latter would be frightened and would bunch up in the farther corners of the pen, and the profit of that day's feed is gone.

The statements of Prof. Mumford that in wool production we are retrogressing is true. Michigan is showing fewer sheep, but the mutton quality is improving at the expense of the wool. It is hard to combine wool and mutton, but the crossing of Lincoln rams on Merino ewes seems to fulfill this purpose. A lot of these cross-bred lambs shown in Owosso sheared eleven pounds of wool per head with a carcass weighing 128 pounds. I am, after much experience with this Lincoln-Merino cross, inclined to believe that it gives the best selling wool and the best mutton as well.

I would feed corn on the ear in preference to shelled corn. I would give the grain feed early and leave hay in the rack for the lambs to eat later. If a man would shell the corn for nothing I would not let him do it, so firmly has my experience fixed my belief in the superiority of ear corn.

A warm barn is better than an open shed.

No one should attempt to feed lambs fast. There is no hurrying to be done about a sheep barn.

My experience with silage for lambs has not led me to fill my silos last fall. My fattening lambs have done as well on dry feed as formerly on silage, but the breeding ewes have not.

Export lambs are coming rapidly to the front of late, and the highest prices are obtained for this class of lambs.

C. C. Lillie: In my statement as to the comparative food cost of beef and butter, I referred solely to dressed beef and not to live weight. That is, it costs as much to produce a pound of dressed beef as a pound of butter.

Mr. Mitchell: Mr. Welch keeps his lambs too long. When a lamb goes into winter quarters he should be in good condition from rape and good pasture, and should gain from the start. I have fed silage with most excellent success. Lincoln sheep are large and coarse; their place is on relatively low ground with good pasture.

A. M. Welch: I shall sell hereafter about Decoration day. I have fed Lincolns, Hampshires and Shropshires. I like half-blood Shropshires the best. I don't want a white faced Lincoln. They will not flock together, but scatter to the four corners of the fields. They are not healthy, either. I do not like a kind of sheep that requires one man running about ahead with a box of tar and another behind with a sheep shears to keep them clean.

H. H. Hinds: Silage is an elegant food for all classes of animals; so is hay and so are roots. The silo it but one method of storing the corn crop. The value of silage and its cost is at least $1.00 per ton, and probably more nearly $1.50. I have fed 500 tons of silage per year and may be assumed to know something about its value. My siloes have a capacity of 750 tons. Siloes should be round and as deep as convenient. The chief value of silage for lambs lies in its succulence. There is a necessary loss in the corn crop in keeping. The corn is in its prime for feeding when it is ripe and fresh. It deteriorates from that forward whether it be stored in a silo or left in the shock. A canned peach is not so good as a fresh one, but it is better canned than dried; so with the corn crop.

Robt. Gibbons: A visit to a sheep farm lately revealed the fact that crossing Rambouillet rams on Merino ewes enlarged the carcass of the lamb and kept up the character of the wool of the fleece, but yielding, of course, a less weight of wool. Mr. Cook suggested an excellent cross, the Lincoln-Merino, but to keep up that practice involves the dependence on others for the pure bloods on both sides.

Mr. Welch has been asked for a description of his feeding rack, and it is here appended.

Length of bed piece, 2 ft. 9 in. 2x4. Height of standard 1x4 oak 35 in. above bed piece on the outside, 32 in. on inside, so as to put top board on slanting. Four pieces of 6 in. flooring for bottom of rack. First board on side of rack at botton 8 in. wide, width of second board on rack 4 in., which is placed 18 in. above top of bottom board, or leaving an 18 in. opening. Third board 6 in. wide, placed on top of standards which are cut slanting. For the side of each, standard of 8 pieces for one rack. Strop or oval iron ⅞ in. wide, 21 in. long, with a hole in each end and counter sunk for 1¼ in. screw. These irons are to hold sliding board in place, which is 1x10 dressed to ¾. Now bore a small hole the size of sash cord in the

center of sliding board, put sash cord through from outside and tie knot in the end, and have cord about two feet long. Place a sash pulley on the outside of 4 in. top board, pass sash cord over pulley to connect to a wire which runs back to end of rack next to alley and fastens to a lever which is fastened on the outisde of bottom board with ⅜ bolt 2 in. long, this bolt to be placed to the end of lever. When the sliding board is raised for feeding the lever should stand straight up and tight against the inside of standard and held to place by a wedge-shaped piece nailed onto side of 4 in. board. There will have to be a slot cut in slanting board on top of rack for lever to work in. Put 1x4 on outside of standards 20 in. from top of bed piece to keep sheep from putting their heads over sliding board when dropped down.

PREVENTION OF ANIMAL DISEASES BY PROPER CARE.

Nowhere in the experience of life do we find the old adage, "An ounce of prevention is worth a pound of cure," more true than in the care of our domesticated animals. If we exclude lamenesses, probably one-half of the diseases affecting our animals, especially the horse, are diseases of the digestive organs. We often underestimate the importance of the digestive system. We are apt to think of the heart and brain as vital organs; so they are, and yet

THE DIGESTIVE SYSTEM IS EQUALLY IMPORTANT,

inasmuch as it prepares the nourishment for all parts of the body. We often seem to think that when the animal takes hay and grain into the mouth it insures their use by the body. This is not always the case, however; before that food can be used by the body it must be digested by a process which is practically liquefaction. It is only that part of the food that is liquefied that can be taken up by the blood and carried to the various parts of the body to nourish them. This digestion is carried on in the digestive system, which consists of a long tube about one hundred feet in length, varying in size and shape in different parts; these different portions being commonly called the mouth, gullet, stomach and intestines. Each part has a work to perform. The mouth pulverizes the food; if the work here is not thoroughly done digestion is interfered with. The gullet simply carries the food to the stomach. In the stomach we find a juice formed which helps to dissolve certain elements in the food. In the intestines the food is mixed with a number of different juices which complete digestion; that part of the food which is indigestible passing on out of the tract, while digestion is going on, the stomach and intestines are in constant motion, thus bringing all parts of the food in contact with the juices and also bringing the digested part in contact with the walls of the tube where it can be taken up and carried to the parts of the body needing nourishment. In order then to have the body nourished

THE FOOD MUST BE DIGESTED,

and in order to have the food digested it must be thoroughly masticated, the juices must be formed to dissolve it, and the organs must be in motion to mix the food and juices and to bring the dissolved portion in contact with the walls of the tube. In order that these last two conditions may be properly carried out, the digestive organs should have during digestion, a free circulation of blood; anything that tends to a sluggish cir-

culation, or to lessen the circulation of the digestive organs by stimulating circulation elsewhere, is detrimental to digestion.

Having thus briefly described the digestive function, certain

PRINCIPLES OF FEEDING

may well be discussed:

1. Feed regularly.
2. Water before feeding.
3. Increase grain ration gradually.
4. Change grain ration gradually.
5. Do not feed grain when horse is tired or hot.
6. Do not give much cold water when tired or hot.
7. Do not exercise violently after feeding.
8. Encourage horse to eat slowly.
9. Do not allow horse to have access to hay continually. The continual use of over-ripe hay, corn fodder or straw as a food for the horse leads to indigestion.

By feeding regularly an animal soon acquires the habit of taking his food at certain times and remains quiet between feeding hours; if fed irregularly he is constantly restless, expecting food at any time. The digestive organs will also perform their work better if the food is taken at regular intervals.

Water needs no digestion, hence if given before feeding it passes out of the stomach into the intestines more easily where there is more surface for absorption, and thus it gets to the parts of the body where it is needed, more quickly. If watered after a heavy feed the stomach is distended, thus interfering to a greater or less degree with its movements, and digestion becomes imperfect.

By rapid eating the food is imperfectly masticated, and the process of liquefaction is carried on with greater difficulty. Rapid eating is encouraged by taking the horse from his stall before his meal is finished.

A sudden change or increase of grain ration is very apt to produce colic.

During exercise the circulation of the blood will be greater throughout the muscles, thus depriving the digestive organs, to a certain extent, and rendering them unfit for the work of digestion. The animal should rest, so that the circulation may become equalized, before food that he can eat rapidly is given him. If fed grain, being hungry, he eats rapidly and the stomach not being in condition to begin digestion, the food sours and becomes more or less indigestible; if cold water is given at this time it prevents, by chilling, the equalization of the blood throughout the digestive organs and thus retards the digestive process still longer. If exercised violently after feeding, the blood will be taken from the digestive organs to the muscles, and digestion will be stopped to a greater or less degree. Toward the end of the journey or day the horse tires, because there is nothing in the blood to nourish the worn out muscles; when he does reach the stable he refuses to feed, and has an attack of colic or indigestion. "Make haste slowly" at the start.

The violation of the proper principles of feeding sooner or later leads to indigestion. This is recognized by general unthriftiness, rough "coat," loss of "life."

THE SIGNS OF INDIGESTION.

The animal tires easily, has as a general thing a ravenous appetite, eating everything he can get hold of; sometimes, however, there is a lack of appetite. The animal is apt to have colic more or less frequently. Again we will recognize bloating. Sometimes only a few of these symptoms are noticed and again nearly all will be seen in the same animal.

TREATMENT.

Obey proper laws of feeding. Give a digestive tonic, perhaps the following:

Gentian, ½ lb.; bicarbonate soda, ½ lb; nux vomica, ¼ lb.; arsenic, 1 drachm.

Mix thoroughly. Dose, tablespoonful in moistened grain morning and night. At noon give a teaspoonful of sulphate of iron and a teaspoonful of saltpetre in the moistened grain. At the end of a week or ten days withhold treatment for three or four days and then resume if necessary. The above dose is for a medium sized adult horse. The cow will take nearly twice as much, the sheep nearly ½ as much. These drugs will also be found beneficial during recovery from the majority of diseases.

CONDITION THE HORSE FOR HIS WORK.

A horse that has been idle for some time is not fit for a hard day's work. In the spring of the year give the horses light work for a while before the heavy work comes on, or if this is impossible, start them into the heavy work slowly. Prevent sore shoulders by thus working the horses in gradually, by having collars fit properly, making them smaller as the horse becomes thinner in flesh. Keep the harness tightly buckled. If the shoulder becomes slightly irritated, remove pressure at once by placing a small pad either above or below the sore spot. Apply two or three times a day some astringent lotion, perhaps the following:

Acetate of lead, 2 oz.; sulphate of zinc, 1½ oz.; carbolic acid 2 or 3 teaspoonfuls; water, 1 quart, or witch hazel, 1 quart. Shake.

It is well to apply this or some other astringent lotion, as sulphate of iron solution, or white oak bark solution, to the shoulders when the horse is first put to work as a preventive measure although there may be no irritation. The above lotion is good for wounds, scratches or irritated surfaces of any kind.

Prevent diseases at time of parturition, as milk fever, mammitis or garget, general fever, inflammation of genital organs, retention of the after-birth, etc., by keeping animal healthy before parturition. Allow liberal exercise. Do not feed much grain, especially corn, rye or wheat. Keep the bowels comparatively loose by laxative diets or if necessary by a little laxative medicine occasionally. Keep the kidneys active by giving saltpetre, a few times, a little while before parturition and also afterwards for a few days.

IN CASE OF MAMMITIS OR GARGET,

give the cow, in case she has not been having laxative drugs, a laxative; from 1 to 1½ pounds of epsom salts, also a tablespoonful of saltpetre twice

a day for three or four days and then once a day until the trouble subsides. Rub the inflamed part well with the following:

Soap liniment, witch hazel, laudanum—equal parts.

If a bad case, bathe with hot water. A good dressing for chapped teats, small sores, etc., is the following:

Subnitrate bismuth, 1 oz.; carbolic acid, 1 dr.; vaseline, 3 oz.

Before introducing the hand to remove the afterbirth or to assist an animal during parturition, oil it well with the following:

Melted lard or raw linseed oil, 1-3 pint.

Carbolic acid, 1 teaspoonful.

The proper strength for a carbolic acid solution for washing wounds and sores is two or three teaspoonfuls of carbolic acid to each pint of water.

Burn or bury deeply, covering first with lime, all

ANIMALS DYING FROM CONTAGIOUS DISEASES.

Disinfect stables or pens where animals sick with contagious diseases have been kept, by first removing all litter and burning it; follow this by giving the interior of the place a good scrubbing with corrosive sublimate, 1 ounce; water, 8 gallons. After this whitewash the walls, using hot water for making the wash and applying while hot.

LINIMENTS.

Turpentine, 2 oz.; aqua ammonia (strong) 2 oz.; soap liniment, 4 oz. Shake.

Or,

Turpentine, 2 oz.; aqua ammonia (strong) 2 oz.; raw linseed oil, 4 oz. Shake.

Both of these are strong liniments. To dilute add more soap liniment in one case, more oil in the other.

RESOLUTIONS.

At this session the Committee on Resolutions presented their report, which, after debate, was adopted. The report follows:

Your committee to which was referred the resolution offered to this Round-up Institute beg to report as follows and move the adoption of the resolutions:

Whereas, The people of Oakland county have done all within their power to make the Round-up the success that it has been, therefore be it

Resolved, That we extend to the people of Oakland our hearty thanks for their kindness, interest and hospitality. Be it further

Resolved, That we rest under heavy obligations to the musicians who have contributed so largely to our pleasure and entertainment.

Further, To the Local Committee who have worked so earnestly for the success of the Institute we rest under special obligations.

Believing it is for the best interests of the Farmers' Institute work that each township have an organization, to the end that the membership be increased and better prepared for the work in the county; therefore,

Resolved, That we, the delegates and members of this meeting, do recommend that each vice-president do organize an Institute Society in his township.

Resolved, That we do heartily endorse One-day meetings in the townships as a means of increasing membership and interest in the work and preparing the way for a more interesting county meeting.

Resolved, That we tender a vote of thanks to the Superintendent of Institutes and to the State speakers for the grand success of the Institute work in our State the past winter.

Resolved, That we do appeal to our honorable State Legislature for a continuation of the appropriation for Farmers' Institutes in Michigan.

Resolved, That we heartily favor the establishment at the Agricultural College of a department which shall have for its purpose the extension of agricultural instruction into all farm communities and the introduction of Nature Study into our public schools.

Resolved, That we favor liberal appropriations to the Agricultural College at the hands of the legislature.

Whereas, The question of taxation is prominently before the people of the State as the most important of all State questions, and, in its proportionate equal adjustment to the various properties of the State the great mass of people are intensely interested; therefore,

Resolved, by this State Round-up Farmers' Institute, That we congratulate the House of Representatives upon the passage of the Atkinson bill and urge upon the Senate an equal loyalty to the people of the State in their action upon the measure when it shall come before them for consideration.

Resolved, That we favor the Kimmis county salaries bill, and urgently ask of the legislature its passage into law.

Resolved, That we favor the building of a woman's dormitory at the Agricultural College to accommodate at least 150 students. Also a dairy building of suitable size and equipment to meet the demands of this important interest of our State in solving the most complex and scientific problems that confront us.

(Signed) D. D. BUELL,
A. B. COOK,
S. R. BILLINGS,
Committee.

FRIDAY EVENING.

Hon. C. J. Monroe presiding.

The Orchard Lake Military Academy Orchestra gave a very enjoyable concert previous to the opening of the evening session.

THE INFLUENCE OF THE SCIENCE MOVEMENT UPON FARM LIFE.

DR. W. H. JORDAN, DIRECTOR N. Y. EXPERIMENT STATION, GENEVA, N. Y.

The utility, the methods, and the results of the Agricultural College effort have been the mark of serious and continued criticism, much of which has come from farmers. In this respect the Agricultural Departments of State Colleges have stood in marked contrast to the Department of Engineering, whose administration and progress as a rule have been unmarked by disturbing or unfriendly comment even from their own constituency. It may be declared, without fear of controversy, I am sure, that in the history of the land grant colleges not only has the great burden of criticism rested upon the Agricultural Department, but those departments have faced problems of administration and method more severe and perplexing than have been met in any other associated lines of instruction.

These criticisms and the problems of administration and method may be grouped around three assertions that often appear in print:

1. Few students enter the agricultural courses, and fewer return to the farm after the completion of their studies.
2. The college course educates a man away from the farm.
3. The courses in agriculture are not sufficiently practical.

First of all, then, it is an undisputed fact that comparatively few young men do enter the full courses of agriculture that lead to a degree, and fewer that graduate adopt practical agriculture as the main life work. This being the case, it is important for us to know the reasons for such a condition. Where shall we seek for an explanation—in the college, or elsewhere?

My conviction, born of observation and experience, is that in the main

THESE COLLEGES CAN NOT JUSTLY BE BLAMED

for the small proportion of students of agriculture who have entered their doors. There are in this audience many persons who have been teachers in the rural schools. Those of you who have had this experience will agree to the statement, I am sure, that only a part and perhaps a minority of farmers' boys could by any known means be induced to enter upon a course of study worthy to appear in a college catalog as leading to a degree.

Many farmers' sons do, however, possess in a varying measure the desire and the ability to acquire knowledge beyond that supplied by the common school. We speak of these young men as ambitious. But what are their ambitions? They are, as a rule, just what we should expect them to be. As these boys sit around the home fireside, many of them listen to the exaltation of riches, professional skill, official power, and forensic or literary distinction as the highest attainments. The volumes of the histories of men and of nations which they thumb tell them, not of farmers, but of legislators, orators and poets.

Now it does not appear, so far as I have been able to observe, that the fathers and mothers on the farm are as a rule out of sympathy with the course which their sons pursue in seeking distinction where distinction has always been found. The critic of agricultural colleges is prone to assume that farmers and farmers' wives are anxious for their bright boys to stay on the farm; but I do not so interpret their pride in the career of the merchant, physician, lawyer or clergyman, whose college education was made possible through their hard work and persistent economy.

I have found from a knowledge of individual cases that this defection from the ranks of agriculture is regarded with the utmost complacency, even satisfaction, not only in the homes most interested, but by the rural communities that take great pride in the successful men they have sent into the business or professional world.

But, granting that a proportion of farmers' sons, who are fit material for the developing and moulding influence of the college class room, are disposed to adopt agriculture as their life work, there are still reasons why many of these have not been inclined to attend the Agricultural College, chief of which has been an

INAPPRECIATION OF THE VALUE OF SCIENCE

in practical agriculture. Twenty-five years ago there was a general attitude of skepticism towards the so-called scientific farming, or book farm-

ing, as it was sneeringly termed. While this attitude has been modified, you will still find, if at farmers' Institutes you enter into conversation with young men, prospective farmers with a good outlook, that they have serious doubts whether after all it will really pay to spend four years at the Agricultural College in preparation for the life of a farmer. One cause of this doubt is that these young men have no conception of scientific truth or its value. They have not turned the first page of the book of nature. They have never been shown the law and order that are everywhere about them, and therefore they do not see how surely added power comes to any man's life when he can understandingly control and direct the forces of nature. The early home training in part, but more especially the common school training, has been responsible for this ignorance about the most important part of human knowledge.

The colleges of agriculture have not only had laid upon them the burden of teaching applied science in a satisfactory manner, but also the greater task of creating a demand for the education which they have offered.

There is little occasion for wonder, then that so few students have been graduated from courses in agriculture in some states. To be sure, your own institution has been a somewhat notable exception to the experience of others. Doubtless this success is due in part to the fine equipment and excellent management of the college. But do not suppose that I propose to measure the value in success of agricultural colleges merely by the number of their graduates that are farmers. I shall refer later to other benefits.

In the second place, the charge is often made that agricultural colleges educate men away from the farm.

There is little ground for the suggestion that the teachers in agricultural colleges are not sympathetic toward their students returning to the farm. If there is fault anywhere within the colleges, it must be chiefly with the courses of study. Let us consider these.

The most carefully elaborated of such courses with which I am familiar are based upon three fundamental propositions:

1. That all young men in college should be taught something of language, political science and philosophy.

2. That thorough and extended instruction should be given in the natural sciences.

3. That the technical instruction should consist mainly in pointing out the relations and applications of science to agriculture, with more or less training in certain expert methods.

It is important to test the soundness of these fundamental propositions, because, if they are defensible, we are bound to accept the consequences of their adoption.

Will the intelligent agricultural masses consent, even in theory, to divorce their calling from a knowledge of these intellectual and spiritual conceptions which are the glory of the human mind and soul? These questions need no reply from me. The common judgment of humanity has answered them long ago. We are bound to freely open to all young men who seek college halls the storehouse of thought and knowledge, in order that, without regard to their proposed callings, they may understand their political, intellectual and spiritual relations.

Again, shall we train the four-years agricultural college student

severely in the sciences? We must, or fail of our purpose. Pedagogically speaking, it is impossible to successfully teach the application of the sciences of the arts without a previous knowledge on the part of the pupil of the fundamental principles and facts of the sciences themselves. It is for this reason that short-course students of agriculture are so serious a problem to the teacher. Some men who pretend to teach or practice agricultural science, but who are ignorant of fundamentals, are like a ship without a rudder—one never knows where they will land.

Aside from a few expert processes, the mechanical or manual side as well as

THE BUSINESS SIDE OF FARMING

can be better learned by experience on a farm that is being managed for business purposes than on a college farm. The time in college is all too short for the learning of principles and for the development of the man, without giving time to those things which may be acquired more cheaply and efficiently elsewhere.

The young graduate, as he steps into the world, pauses to survey the field before him. He has no capital, perhaps, and so can he be blamed if he consents to sell his time to the highest bidder? What would you do if in his place?

Shall he go back to the farm as a hired servant? If he has broad acres of his own or may acquire them, and loves the farm, if he can see the great possible usefulness that lies before him as an apostle of enlightened agriculture and the high standard of living that he may attain with the peace and beauty and inspiration of nature all around him, then he should return to his farm, and we give him our hearty welcome. No more useful citizen can be found than he may become, and his measure of recompense and satisfaction will be all the larger because of his college training.

It is certainly Utopian to expect a much larger proportion of college educated men among farmers than in any other important industrial class. I doubt if well-informed agriculturists, in passing judgment upon other classes, are prepared to assert that the mechanics in our workshops, where intelligent, skillful labor, accompanied by more or less knowledge of principles, is demanded, should generally be college graduates. They would not claim this of the commercial world. It is self-evident that some mechanics and business men should be, or even must be, highly trained, but it would be foolish to expect this of more than a small minority. What farmers are not justified in claiming for these others, they may not reasonably expect in their own ranks. Every calling has its gradations of opportunity, with corresponding gradations of encouragement for the investment of intellectual capital. No business will ever be an exception to this rule. There are many openings in agriculture—and these are on the increase—that offer encouraging recompense to the man who has taken his baccalaureate degree, but on the farm, as everywhere else, the law of supply and demand is in force.

The considerations already presented to you make it clearly evident that the great bulk of the agricultural population will not in the future any more than in the past come up to the agricultural college for an education. Not even the short winter courses provided at some institutions, and which are generally attended in a few states, will secure a

general systematic instruction in the fundamentals of science as related to the farm. These short courses are doing a grand work, but they fall far short of compassing the whole field. We must from now on, if we have not done so before, face the problem of providing in the public schools or in wide-spread special schools the education in the natural sciences which seems to be so essential to those who practice the art of agriculture. Just how we shall accomplish this does not yet appear. But, whatever plan may be adopted, there is no avoiding the conclusion that at the head of this educational effort will stand the Agricultural College for the training of experts, teachers and leaders, and for the direction of plans and methods. This, then, I believe to be the mission of Agricultural Colleges. How shall this mission be executed?

THE EXPERIMENT STATIONS.

The boards of control of the land-grant colleges have been intrusted not only with a special educational effort in the interests of agriculture, but also with the investigation of problems important to agriculture. The experiment stations are in most cases departments of the State colleges, and very properly so, for they are a logical result of college influence. They were made possible through the efforts of agricultural college men, and their staffs have been selected almost wholly from the graduates of the institutions into whose care they are committed. It is safe to say that, without the Morrill act of 1862, the Hatch act of 1887 would even now be a remote possibility. It has become, therefore, the mission of the agricultural colleges to guard and cherish this effort of investigation as carefully and as loyally as they have the department of instruction.

But what should this investigation be? In other words—what is the function—the mission, if you please—of the agricultural experiment station? I ask these questions because, in my judgment, the true work of the experiment station is not properly understood by the agricultural public. It is even possible that here and there a board of trustees has misconceived the real intent and requirements of the Hatch act.

There is a tendency to ignore the essential difference between instruction in things known and the discovery of things unknown, between teaching and investigation.

THE FUNCTION OF THE EXPERIMENT STATION

is to investigate. It is not a pedagogical institution, nor it its primary work to give popular instruction from the institute platform. It is necessary for the station worker to keep in touch with the pedagogue and with public opinion and needs; but his chief business should be to continuously and severely study the unsolved problems in chemistry, physics and biology, whose solution is essential to progress in agricultural practice. Now, there will rarely be combined in one man the successful pedagogue, investigator and institute speaker. The limitations of time and strength, to say nothing of the special fitness and preparation for each line of work, preclude the possibility of the highest success in any direction when thought and energy are so divided.

Do you, as farmers, demand popular instruction from the institute platform? It is unwise to ask much of this from the already overworked

teacher. Must you have teachers in your college? Then give them time to study and to think.

It is unnecessary, perhaps, to remind you that the agricultural class includes more than the farmer himself—it embraces the farmer's wife, the farmer's son, and last, but in no sense least, the farmer's daughter. By this I mean to declare that not only the art of agriculture, but the home with its environment and the proper nurture and training of the children to take their places as workers, as husbands and fathers, as wives and mothers, are involved in the spirit and purpose of the first Morrill law. This act of Congress has a most comprehensive relation to the life of the people. The laws of chemistry and physics that the farmer must consider should be recognized by his wife. The principles that pertain to the feeding of colts and calves are identical with those that are related to the feeding of children. The outlook in literature, philisophy and economics that are so important to the man, are equally important to the woman, who, as a mother, is so potently determining the status of our citizenship.

It is the industrial classes whose liberal and practical education is to be promoted. What a vast responsibility such a scheme of education entails! These classes are the seed-bed of the nation's character. Here we sow knowledge, interpretation of truth, sentiment and moral purpose in a fertile and responsive soil, each to spring up and grow and fruit after its kind. Here and there some towering growth in industrial effort, in literature, in statesmanship, or even in the art of war shall encourage and inspire us; but we shall accomplish our chief and highest purpose if the life currents of the people who attain no high altitude of intellectual or social distinction shall build into the body of our nation the enduring and invincible fiber of truth, justice and patriotism. Upon you, citizens of this State, has been laid the duty and high privilege of ministering in no common degree to the nourishment and manner of growth of this dominant republic. May this heritage pass from generation to generation as a solemn and cherished trust!

FARMING IN ORIENTAL COUNTRIES.

PRES. JAMES B. ANGELL, UNIVERSITY OF MICHIGAN.

While farming throughout all nations in the far East is carried on in much the same way, I will speak particularly of farming in China and in Turkey.

In China agriculture is held in high honor, as is apparent from two facts: First, the Emperor, who is regarded as the Son of Heaven, and who is rarely seen by his subjects, goes in the spring to the Temple of Heaven to offer sacrifices and prayers. On that occasion, with much solemnity, he turns a furrow in recognition of the goodness of heaven in furnishing the crops and of the dignity of the farmer's pursuit. Secondly, in the Chinese classification of people, the scholar is placed first, but the farmer next to him. After the farmer comes the artisan, and still lower in rank the merchant.

Theoretically the fee of the land is in the Emperor, but the people occupy as tenants, paying as taxes or rent about one-tenth of the produce.

The farmers, as in some European countries, generally live in villages, going out into the country to till their land. Probably this collection in villages was chiefly for safety. A village usually consists of families related to each other and governed in local matters by the elders, who are literally the older men, the grandfathers.

CAUSES OF FAMINE.

The production of China is sufficient for the sustenance of the people, but the suffering from famines in certain provinces is due to the fact that the roads are so bad and so few that food can not be carried to the sufferers from distant parts of the empire. Even in the capital itself the streets are so bad that one of our spring carriages could not be used there. Heavy, springless carts are used for carrying passengers in Pekin.

The holdings of land are generally so small that the owners might often more properly be called gardeners than farmers. Though the population is so dense there are large tracts of land uncultivated, partly because the people have not the skill or the capital to drain it, if it is swampy, or to protect it, if it is subject to ravages by the rivers, and partly because of plundering by corrupt officials.

The crops in the north are wheat, millet and barley; in the middle and south rice, tea, sugar cane, cotton and hemp.

The tools are very simple and rude. The one most used is a heavy grub hoe. The plow is of primitive form—the same which has been used for 2,000 years. It scratches the ground about three inches in depth. They have no implement comparable to our scythe or sickle. A heavy knife, something like our old fashioned corn-cutter, is used to cut the grain.

HIGH STATE OF FERTILITY.

They gather with great care everything which will serve as manure. They apply the manure rather to the hill than to the field at large. So large a part of the year is comparatively rainless that they take much pains with irrigation, conducting streams to the fields or drawing water from wells. Animals are not much used. Men are to a great extent the burden bearers. Wheelbarrows, which will carry some hundreds of pounds, are largely used.

They commonly sow their grain in hills, separated widely enough to permit the planting of another crop between them. Rice is sown first in a small plot highly enriched by liquid manure, and the shoots are transplanted to a wet field, ploughed by water buffalos. Cotton fields are often made to bear a winter crop of wheat. Mulberry trees for feeding silk worms are planted in rows twelve feet apart and trimmed back early to multiply leaves. Tea is generally not raised in large plantations, but small cultivators have a few bushes, from which they strip three crops of leaves a year. The Chinese have much skill in raising flowers and in dwarfing trees, which they trim into fanciful shapes. They have a variety of fruits, of which the pears and grapes are the best. Our missionaries have introduced a few American apples. The Chinese have some method of keeping grapes fresh and good as late as May. They do not reveal the secret. It is supposed they hang them on sticks in dry subterranean caves or cellars.

The peasants are as a rule very poor. Their industry rarely succeeds in gaining for them much accumulation for old age.

IN TURKEY.

In Turkey the land is divided into three classes: That devoted to the support of the mosques, the crown lands, and lands held in freehold. The first two claims comprise, perhaps, two-thirds of the territory. The tenants pay for the occupancy of them. The laws of ownership and transfer of land are complicated, and many disputes about titles arise. The freeholds are small, usually running from five to forty acres. Formerly villages had commons and forests, which rapacious officials have now seized. Farms are sometimes tilled on shares, the occupant furnishing cattle, seed, labor and taxes.

The poor farmer, who is cruelly plundered by the tax gatherer, is also often burdened by having troops quartered on him, and by being obliged to furnish transportation for soldiers and military stores. The Armenian peasant, in addition to bearing the above burdens, is frequently robbed by Kurdish chiefs, who pounce down from their mountain homes on the villages in the plain. Frequently the Armenian village pays a regular contribution to one Kurdish chief, who then undertakes to defend it against the depredations of other chiefs. Of course the peasant's conditions of life are hard, and poverty is widespread.

CHIEF CROPS.

The crops are the cereals with which we are familiar, and in some places rice, and in many provinces tobacco. This last article is a monopoly of the government, which buys the whole crop and forbids farmers to sell any part of their crop to any one but the regularly appointed agents. Mulberry trees are also cultivated for feeding silk worms.

The methods and tools of the peasant are much like those of the Chinese. The grub hoe, the antiquated plow, the rude harrow, are the implements. Irrigation is widely used. The grain is threshed by the tread of animals over the threshing floor of clay. One does not see our modern machines, except on a few great estates near Constantinople. Some regard is paid to rotation of crops. Manure is scanty; sometimes the land is fertilized only by the sheep roaming over it in spring and in autumn.

Of their fruits, the cherries and strawberries are excellent; the apples and peaches are inferior to ours. The figs and grapes are very abundant and good.

The Turks use animals far more than the Chinese. The Arab horse and crosses of that stock are everywhere to be found. The oxen are strong and vigorous and much beloved by their owners. Sheep are raised in vast numbers, in Asia Minor the fat-tailed sheep. Goats are raised in large numbers, and camels are used to a considerable extent.

The agricultural resources of the empire are great. Under a better government and with better methods and implements they might be vastly increased.

OBSTACLES TO SUCCESSFUL AGRICULTURE.

The drawbacks to success in agriculture are similar in China and in

Turkey. The people are looking backward rather than forward for their ideals. The Chinese look to their remote ancestors five hundred years ago for examples. The Turks look to the Koran and the times of Mohammed, twelve hundred years ago. Hence, progress and change are almost unattainable.

Again, they have no desire for labor saving machines, as they have no diversity of pursuit.

They are both afflicted with corrupt officials, who, receiving scarcely any salary, live by plundering the people. Justice is not to be found in the courts for the poor litigant. The people, having no voice in the government, have no redress for abuses which they may suffer. They have thus no inducement to accumulate wealth or to improve their industrial processes.

Finally, there is a great lack of intelligence and education. They have not learned that the first step in making a good farmer is to make a *man*.

It is the good fortune and the glory of Michigan that our fathers planted public institutions of learning: The agricultural college and the normal school, the university, the free schools, with the clear perception that to prepare a man for any honorable pursuit a wise and rational education must be secured for him. May their descendants have the wisdom to give a generous support to these institutions, from the lowest to the highest.

WOMEN'S SECTION OF THE ROUND-UP.

MRS. MARY A. MAYO PRESIDED AT ALL SESSIONS.

WEDNESDAY AFTERNOON, MARCH 1.

Meeting was opened by repeating the Lord's prayer in concert.

THE CHEMISTRY OF COOKING AND CLEANING.

MISS ELLEN R. RUSHMORE, INSTRUCTOR IN DOMESTIC SCIENCE, AGRICULTURAL COLLEGE, MICH.

The question of foods—the value of foods—the cost and production of foods—these are among the important topics confronting our civilization. The men who are devoting their time and attention to the study of social conditions, to the conditions of the laboring man, and of pauperism and crime, are coming to see the relation between normal, healthy bodies, which are partly the result of good food, and normal, healthy minds. There is probably no exact method of calculating the amount of sickness, crime, and misery that is caused by errors in diet.

The farmer is learning that if he is to produce certain characteristics in his stock, he must use certain definite foods, and observe certain laws. The governments of all civilized countries pay special attention to quantity and quality of food given to the army. The exact amount of food required to maintain a certain standard of health and working capacity has been accurately estimated. But the question of food for average men and women is just beginning to receive the attention that it should.

First, we must look at

THE HUMAN BODY.

What is the body? It is, briefly, an extremely complex and delicate machine, fitted to do many different sorts of things. It moves and overcomes resistance. That is to say, it works. So far it is like a steam engine. The steam engine and the body are both losing heat as they work—that is, they are losing carbon and hydrogen as carbon dioxide and water. We burn wood and coal to give heat to make the engine run, and we put fuel in the body to give heat to make the body work. In the coal and wood there are certain parts that will not burn; they are called ashes. In our foods there is also a part that will not burn, which is also called

ash, or mineral matter. From the fire waste products are given off—smoke, soot, water and carbonic acid gas. From the body water and carbonic acid gas and other waste products are given off.

But the figure stops here. Living bodies differ from an engine in a most important respect: They have the power to repair parts that are injured, and to make new cells, and to grow; while when the engine is injured or out of order, it must wait until some man comes to repair it. It has no power to mend itself.

FOOD IS THE FUEL OF THE BODY.

It gives heat and energy to the body; but in addition, it repairs waste tissue, and builds up new tissue. Some one may ask, how does food give heat and energy? Where do heat and energy come from, and how does the body make new tissue and repair itself? To answer these questions thoroughly, one would need to write many books. But, first I must ask the question: What is heat? Heat is described by the scientists as molecular motion; that is, a motion of the smallest particles of which a substance is composed. When an article is cold, its molecules are said to be vibrating slowly; when it is warm the molecules vibrate more rapidly. Sometimes the motion is so vigorous that the substance seems to disappear from view altogether; for instance, when water becomes steam.

Heat, then, is motion—it is one of the forms of energy. But how does heat get into our food? It is simply absorbed from the sun—primarily in plant life; secondarily, as animal life, and stored up as latent heat, it is ready to work when we want it. So when we eat, by the vital action of the living cells of the body, the heat of the food is set free in our bodies and we are warm and able to work. And how does the body repair itself and make new tissue? This is the mystery of life—not to be solved yet.

Having come, then, to an idea as to what food is, and what it does for the body, we are confronted by a number of

PRACTICAL CONSIDERATIONS

such as the following: What and how much food should we eat? What effect do foods have on the body? How can we get the heat and waste foods for the least money? How should our foods be prepared so as to give us the best results? It will be impossible to answer all of these questions here—only a few of the most obvious conclusions will be pointed out.

It will be apparent, even to an untrained observer, that there is a decided difference between water and corn; between salt and vinegar; between bread and meat. Men have studied about foods, and experimented on them, and have formed a few conclusions which we may accept for the present. We can group together or classify foods according to their characteristics. Water will not burn, ordinarily, and salt will not burn, but oil will burn. Therefore, we may divide foods into those that burn, and those that do not burn—or the combustibles and incombustibles. Water and mineral matter are substances that do not burn—found in our ordinary foods. They give no heat to the body, but are necessary to maintain health, and to help form tissues of the body.

But the foods which do burn and give us heat, are those which contain nitrogen, and are called proteids, while those containing no nitrogen are starches, sugars, fats and oils. Such foods as vinegar and alcohol are not true foods, but are called food adjuncts.

THE FOODS, THEN, THAT ARE OF VALUE.

in giving heat and forming flesh are starches, sugars, fats, and oils and proteids. But does each of these give the same amount of heat as the others? Is each class of food equally desirable?

One pound of starch, if burned outside the body, will give 1,860 calores.

One pound of fat will give 4,220 calores.

One pound proteid will give 1,860 calores.

Fat will give much more heat than starch or proteid, because it is already in a less oxidized form.

When foods are analyzed, it is found they are made up of water, mineral matter, starches, sugars, fats and oils and proteids, and other substances of less importance as foods. The object in selecting food should be to arrange the daily bill of fare so as to get the proper amounts of nutrients in the most palatable, most digestible, and most economical forms. Our food may contain much water and very little of nourishing material—for example, tomatoes; another may consist largely of starch—for example, rice; another may contain much proteid, meat, for instance.

HOW TO COMBINE FOODS PROPERLY

is a question that concerns everyone. It has been found that an average man, doing average work, needs about 29 ounces of solid food per day and six pints of water, as follows:

Starch and sugar	16 oz.
Proteid	6.4 oz.
Fat	6.4 oz.
Mineral matter	1.6 oz.
Water	6 pts. or lbs.
Oxygen	$1\frac{3}{4}$ lbs.

Many persons never think of oxygen as part of our food; but it is essential to life, and must be taken account of in considering the daily income of the body.

Even with a careful and accurate study of foods, and the most scientific methods of cooking and serving, some men may suffer from errors in diet. To every one it can be said that there is no absolute rule to be followed in the choice of food for average persons. What may agree with one man may be poison for another. The wise man will study himself, adapt his food to his own peculiar needs, and use his common sense in the matter of eating and drinking as much as in other affairs in life.

DISCUSSION.

Mrs. Jones: Do you think that the condition of the kitchen—its condition of cleanliness—has anything to do with the wholesomeness of the food prepared therein?

If you are making bread, is the bread better if the room is thoroughly clean and well ventilated?

Miss Rushmore: I should say it would be, with some kinds of food especially. You know, bread is what you might call finicky, and it won't rise if it doesn't have the right temperature, etc. Milk and butter, in particular, will absorb odors. I should say that the cleanliness of the kitchen would have as much effect upon the physical condition of the person working in it as on anything else.

Mrs. Hatch: What is the best temperature for raising bread?

Miss Rushmore: This is a disputed point, but I think between 90 and 100 degrees is best. You are safe in having it at 90 degrees. Do not have it over 100 degrees.

Q. Is there any advantage in keeping potatoes boiling hard when they are cooking, or would you let them simmer?

Miss Rushmore: A disadvantage in having them boil too hard is that they will break up. If you have the water at the boiling temperature food will cook just as well, and will not break up. The water should be kept boiling all the time.

Mrs. H. H. Hinds: Does the temperature have anything to do with the boiling?

Miss Rushmore: I think that question would best be answered by stating what temperature means. We have a certain quantity of heat just the same as we can have quarts of potatoes, or anything of that kind. All vegetables should be put into water that is actually boiling, because in this way they cook better; cook more rapidly; do not absorb so much water when cooked in this way. The temperature of the water should be 212 degrees.

Mrs. Geo. Pangman: How long is it necessary to mix dough to make the best bread, and how is the best way to tell when it is just right? Would you mix once, twice, or three times?

Miss Rushmore: I think that is a question which has not been experimented upon enough yet to make definite statements. I believe that bread made as quickly as possible is the best. The more yeast which is used, the less time it will take to make the bread. I think it is best to use more yeast and make the bread more quickly. It is only a question of whether we shall use more yeast or not. Nothing is saved, in my judgment, by using a small quantity of yeast, because we run the risk of letting the bread turn sour by standing so long.

Mrs. Irma T. Jones: Do you not think that the amount of mixing is controlled by the preference of the bread maker?

Miss Rushmore: Yes. Some people like bread kneaded more than do others. When I make bread I take a large quantity of yeast. We plan to make bread in three hours. We take two and a half cakes of compressed yeast to one pint of wetting. This will make one large or two small loaves. This, of course, is extravagant, but this is made for class-room work, and has to be made quickly. I should say that one-fourth of a yeast cake to a pint of wetting, or one yeast cake to five loaves of bread, is a good proportion.

Mrs. Elliott: What is your formula for making yeast?

Miss Rushmore: I do not make it, I buy it. If I did not do this, I should buy dried yeast cakes and simply dissolve them and make them into bread.

Mrs. Irma T. Jones: May I give the experience of one bread maker? This was one yeast cake to half a pint of water; as soon as moist, add a little flour to make a thin batter, and this made good bread.

Mrs. Elliott: You can't make good bread with dry yeast without using potatoes. I have tried it and failed.

Mrs. P. G. Towar: Not long since we had no yeast on the farm, so I took one dry yeast cake and softened it in milk, mixed this in hard loaf, and when light rolled it in the pans and baked it, without any potatoes being used, and it was very nice. I know from that experience that we can make bread without potatoes.

Mrs. Gulley: Have the potatoes anything to do with making the bread moist?

Miss Rushmore: Yes, they do, because the potatoes are cooked before putting into the bread, and starch always takes up a great deal of water when it is cooked.

Q. How many times is it necessary to mix bread? Do the bacteria in an untidy kitchen enter the bread while raising?

Miss Rushmore: Yes. For even if the bread is covered any slight wind will allow the bacteria to get in. Bacteria will get into anything that you have unless it is thoroughly sterilized, because they have a way of floating through the air. Everything exposed to the air is covered with more or less numbers of bacteria. Mix the bread up quite warm. Scald the milk, if used, or put the salt and whatever sugar I use, and butter, if I use butter, and let it dissolve the butter. Then

stir in enough flour to make a pretty stiff batter, so that it can be well beaten. At this point I give it a good beating to mix the yeast thoroughly. The yeast has been mixed in lukewarm water and put into the batter. Stir until tiny bubbles of air appear, then add more flour at once—enough to make a stiff dough—and knead it until it is elastic to the touch. Put it in a bowl or pan and let it stand near the stove, with a damp cloth over it—something to keep out the dust, and moist to avoid a crust forming over the top, but which is not absolutely air tight. Then when the dough has risen to twice its original size I take it out and simply roll it enough to shapen it and put into the pans. Then allow it to double its size again. It is best to bake this in two pans, so as to get as much crust as possible. Allow about forty-five to fifty minutes for baking a small loaf; forty to forty-five minutes for baking biscuits. This takes about six hours, if it is kept in a warm place so that it will rise quickly.

Mrs. Kennedy: I would like to ask a question in regard to whole wheat flour. I understood Miss Rushmore to say that the cheaper foods are the best foods.

Miss Rushmore: I said that the cheaper foods were the best foods, provided that they were equal in nutriment. I can most certainly recommend the use of whole wheat flour, and it is better to pay a little more for the whole wheat flour, and get as much nourishment as possible out of it. Our ordinary flour contains eight to ten per cent of the protein. It is wise to buy whole wheat flour. It is more nourishing than graham flour or the ordinary flour.

THE MOTHER'S GREATEST NEED.

MRS. IRMA T. JONES, LANSING.

Home-making is the most important profession. If there be any class which more than another needs encouragement, and the aid of all possible enlightenment for the duties of its arduous vocation, it is the mothers of the world. The home has been called the soul of the nation, and the responsibility of caring for that soul rests upon American motherhood. This is no insignificant trust committed to women when it is considered that "just government, pure politics, honest commerce, wholesome literature, good citizenship, even genuine religion, all depend for their existence and continuance upon the home."

How essential, then, that home-makers understand that

THE HOME IS THE TRUE UNIT OF SOCIETY;

that the child must be prepared to become a useful factor in the world's work; and also what the home should stand for in the training of future citizens and home-makers of the republic.

Every heart enshrines a mother. Hers is the first influence to call a responsive smile from dawning intelligence; hers the last memory to soothe the weariness of the dying. Sooner or later the cry of every human heart takes up the poet's refrain:

"Backward, turn backward, O, Time, in your flight,
Make me a child again, just for tonight;
Mother, come back from the echoless shore;
Fold me again to your heart as of yore."

Humanity's supreme need is better mothering, aye, and better fathering, too. For the needs we are to consider are those which relate to fathers as well as mothers. It is a fatal fallacy to exempt fathers from the humanizing care of little children, or from that education and culture which prepares them for the divine grace of fatherhood. With Dr. Hervey, I believe that mothers have no monopoly of the privilege of sing-

ing lullabys or telling bed-time stories to the little ones. Let both parents share the ministry to their children, if they would gain the soul-culture the Lord intends as the reward of parenthood.

The Spanish have a proverb, "An ounce of mother is worth a pound of clergy," which may be translated to mean that a mother's influence counts for vastly more in moral training than pulpit exhortation. Hence

PARENTS NEED TO BE WHAT THEY WISH THEIR CHILDREN TO BECOME.

Do you wish your child to be honest and truthful, genuine and sincere? *Live* the truth as well as speak it. Would you have children with engaging manners, gentle, courteous, considerate of others, reverent and upright? Such must their parents be. Said Emerson: "What you are, thunders so loudly in my ears that I cannot hear what you say," which is but a poet's way of saying: "Example is better than precept."

What shall the home stand for? Not physical comfort merely. It must mean more than a boarding place which furnishes food and shelter; more than the guardianship which clothes and feeds the body but neglects the mind and heart. Many a daintily fed, beautifully dressed child endures a perennial soul hunger which leaves him a helpless starveling when obliged to combat the world and its temptations. To be able to fortify her child and prepare it for life and usefulness, the mother needs to have her natural human maternal

INSTINCT CHANGED INTO INSIGHT.

This larger faculty divines the greater needs of the mental and moral nature. Instinct narrows life to the animal plane, insight enlarges and enriches every phase of being. Insight supplies sympathy, inspiration, appreciation, sows seeds of aspiration, reverence for authority, love of knowledge, and moral rectitude. Instinct is prime minister to selfishness; insight blossoms continuously in all beneficent endeavor.

Mothers need the coöperation of their children's father. A home with divided interests is a perilous place for moral well-being. A strong argument against many secret societies is this division of interest between husband and wife. With absorbing devotion, father goes one way, mother another, and the children are left to get on as they can. "Together" is the watch-cry of the hour. Let parents consult together concerning the home nurture of their little ones, and as they value the happiness and comfort of their declining years, let not one antagonize or undermine the influence of the other. Like the eagle with broken pinion trying to save its nestlings from harm, is the mother who has not the coöperation and moral support of her husband in the training of her children.

Home-makers need to

UNDERSTAND HOW TO ORGANIZE FAMILY LIFE,

so that symmetrical development and growth for all may be possible. System leads, hurry drives; only where order and promptness prevail is there harmony and progress. A wider recognition of the possibility of so adjusting one's time as to give each faculty a chance, is a great need

in home life. Time for reading, for rest, for amusement are as requisite as for working and eating, and for "getting on" in the world.

To the kindergarten teaching of the science of motherhood, the world owes much that is helpful. From that comes the thought that parents need to live *with* their children as well as *for* them. To live with the child so that it feels the interest, sympathy and companionship of its parent's loving heart is to learn one of the most profound secrets of child-nurture. To look upon life and its incidents from a child's point of view, rather than solely from the vantage ground of maturity, to be interested in its joys and sorrows, to guide and counsel, to confide in it and to make it a partner in all the concerns of the home is to enrich and strengthen it for all time. Powerful, indeed, must be the temptation which can draw the young from such companionship.

The mother needs to believe in the value of a good education, for her boys and girls. Preparation for life's work can not begin too early; those who are thoroughly equipped are the winners in the race. To be equal to the demands of our times, the boys and girls must have the best education possible. If the mother lacks the conviction and earnestness necessary to struggle and sacrifice to this end, who will plan that John and Mary have the chance? With the belief in education, the wise mother will aim to train her family to respect their bodies and to observe the laws which govern their well-being. Health, vigor and purity of mind and body are the triune virtues she covets for them.

A FAMILIARITY WITH THE WORLD'S BEST LITERATURE

is one of the most helpful contributions a woman can bring to the pleasure and success of the home. Nor is it impossible to the poorest or lowliest in these days. Indeed, I count it one of the necessities of our stirring modern life. Once acquire a love of reading the best books, and make a beginning, with perseverance none need despair. The busiest farm life furnishes some leisure hours and seasons for which a little forethought can provide reading matter at a surprisingly small cost.

A German sculptor spent eight years in making a statue of the Christ. When he had wrought two years, he stood a little child before it, and asked: "Who is it?" The child said: "A great man," and the sculptor knew he had not succeeded. He began all over, and when at last his work was complete, he again brought a little child to be critic, and said: "Who is it?" And softly and with awe, the child looked up into his face and answered: "Suffer little children to come unto me." Then the artist knew that something of his ideal of the Divine had entered into the lifeless marble.

Thus I think that every woman needs to seek to place the Divine in her home life. More than all else, she needs the joy, the comfort, the inspiration, the staying power of the one Friend of all mothers—the personal friendship of Him who never spoke an unkind or disheartening word to any woman. With such companionship, she may work out wonderful ideals in her own life and those of her children, till those beholding the results shall exclaim: "Of such is the Kingdom of Heaven."

DISCUSSION.

LED BY MRS. MAUD B. SHATTUCK, OAKLAND COUNTY.

This subject of the mother's greatest need is of great importance to us as a nation, for it is a fact that mothers are the molders of national character. Woman is the mother of judges and legislation, and the educator of the ideal citizen. From her they first learn to honor the flag of their native land. If men are to be good citizens she creates in their boyhood the elements out of which this character is formed. With the good homes and true mothers the State is safe, for the most orderly and conscientious citizens are those who have learned cheerful obedience to authority at home.

In thinking of this theme I could hardly conceive of any one need of the mother that could be greater than a host of others that came to my mind, but finally concluded that if there was any one it must be tact, not in one thing alone, but in all the elements that go to make up the characters of the lives placed in our charge, for they must be built up on every side, that symmetry may appear in the result. Tact is something that we may not have to begin with, but we have no right to live without it.

We may agitate this question of the mother's needs all we will in our meetings, and it still remains for the mother to watch carefully all the traits that go to make up the disposition of her child, and then to tactfully and prayerfully guide the little one into a haven of safety. Too much attention cannot be given to the old adage, "As the twig is bent the tree's inclined." You can mold a child's mind so as to yearn for evil thoughts, or, on the other hand, to shrink from them; you can teach him the habit of speech that demands by words and oaths, or a purer form. You may lead him into paths of honesty, industry and generosity until the ways of vice, idleness and selfishness would be distasteful to him. But in these times of great excitement and unrest, when so many snares are set for the feet of our girls and boys, and even at our very doors, we mothers must be indeed vigilant, constant in season and out of season, yet withal very tactful.

Take, for instance, the lesson of obedience, which is one of the first lessons a child needs to learn. What adult has attained the highest mark unless he has been obedient to the dictates of conscience, to the laws of God, to the laws of our being and to the laws of our country? We are aware that different dispositions need different treatment. I have often heard a mother of a large family say that what she does by one child she dare not do by another, and that to obtain obedience from one would not require any effort, while with another the greatest tact would need to be exercised.

Then again, if we would have our children truthful in all things, great care should be taken that through fear of punishment or any other cause we may indirectly be the cause of their becoming untruthful and deceitful. If we would retain their confidence, which is so dear to us and to them as well as helpful, we must study well their nature that we do not drive them from us. I call to mind a family of four children where the mother kept the confidence of three of them through direct questions and a show of interest in whatever pertained to them, while this very method had the opposite result on the fourth.

Then when we think of the religious training, who can over-estimate the responsibility resting on the mother? From the Book of books we learn "Children are an heritage of the Lord," and again are we admonished to "Bring them up in the nurture and admonition of the Lord." Thus are they acknowledged to be gifts from God, and we as mothers must be responsible to Him for our wise and faithful care of them. We must try to realize our possibilities and guard against being satisfied with a low standard.

The best that any parent ever accomplished in any instance is not too high an ideal for the mother of today. By our gentleness and thoughtfulness, by our sympathy and love, we have a natural control over them which it is criminal for us to neglect. We do not say that it is necessary that every mother should be learned or wise or highly cultured, although this is a great help, but to win our children for Christ we must live Him, and then use tact tenderly and wisely in dealing with their spiritual nature. We may do many good things for our children. We may teach them many things which will adorn their life and character. We may impart to them knowledge that will be of value to them in their life work; yet if we do

not succeed in leading them to Christ we have failed in that part of our responsibility which is most essential and vital. I believe it possible that with exertion and the right means the mother may have more control over her children than any other influence. But if we delay the work until the child is too old we may say of ourselves as did H. H. in the last lines that she ever wrote:

"Father, I scarcely dare to pray
So clear I see, now it is done,
That I have wasted half my day
And left my work but just begun."

Q. How far would you encourage the imagination of a young child, and how teach it the difference between a purely imaginable line of thought and a story? Where is the dividing line?

Mrs. Irma T. Joues: The imagination of a child is one of the most valuable things, and we must not neglect it, but I think that possibly today the use of fairy stories, and so forth, have reached the point where it is time to call a halt. We should watch carefully the nature of the child. It is during the first three or four years of a child's life that the imagination is so large. This should not be neglected, but try to turn it in the right direction. This faculty of imagination lies at the bottom of our faith faculties. We should strive to understand the other traits of character in a child, and if it has an abnormal imagination, try to turn it in the right direction—train it, as it were.

Mrs. Rockwell: I have found that the fables are good in training the imagination. It can be trained beautifully in this way. When they are trained after those methods, which are very interesting to a mother as well as to a very small child, they bring the desired results.

Mrs. Irma T. Jones: I would recommend Elizabeth Harrison's "Study of Child Nature" as a good book for this purpose.

Q. How would you manage a girl who is very mischievous?

Mrs. Jones: I have said that activity is one of the laws of child life, and I should seek to find out the things that that child liked to do best—that she really enjoyed—and then I should seek to be all the time finding something positive for her to do. This habit of everlastingly saying "don't," "don't," is very harmful to children. We should come into that spirit where we can give something definite and positive to our children to do.

Mrs. Kennedy: As to finding out what a child likes to do, I would like to give a little experience of my own in regard to this. I have two boys, and the older one is very fond of reading the papers, especially the news of the war. I thought he was reading too much of it, and endeavored to induce him to read something different, but he said he wanted to read about the war—he wanted to read the news up to the times. Finally my eyes became affected, and I suffered a great deal with them. When this boy saw that I could not read for myself he said he would read to me, so he took the book that I was trying to read, and read to me. We did this way for some time, and I was careful to select reading that I thought he would become interested in, and that I wanted him to learn to like, and it proved to be very beneficial to both of us, and we both enjoyed it.

Mrs. Campbell: I think with restless children that they can be helped to a very useful knowledge by teaching them to sew. Most children like to learn to sew if they are given nice pieces of cloth to work with. And a girl especially likes to learn this, if she can make something for her doll. I think we should also teach the little boys to sew.

Mrs. Jones: Do you not think we are apt to be too impatient with their crude attempts, and do not encourage them enough, but rather discourage them?

Mrs. Hatch: I think it a very good idea to instruct boys how to sew, though I would not compel them to do it. Think it a good idea to teach our boys to do the same things our girls do, and then they will be more interested in it. I am very glad that at the present day girls are sharing more of the athletic life of the boys, and I think it a good idea for the boys to be taught some of the things that usually only girls do. I also think that women should know something of child nature.

Mrs. Jones: I believe that many of us would be greatly surprised if we could see the inside of our child's mind sometimes. We should strive to keep in close touch with them—note their progress—and in choosing reading material, etc., for them, choose it a little ahead of them, so as to encourage them. Do not give a child a book written in one syllable to read after he is capable of reading something harder, but give him something to work for.

Mrs. Jones: How would you increase tact?

Mrs. Shattuck: By studying ourselves; by studying our children, and in that way learn to deal with them rightly. I think we can acquire tact—by study and perseverance, etc.—just the same as we can acquire anything else. We ought not to use too much sympathy—do not allow love to come in and take the place of discipline.

Mrs. Mary A. Mayo: Don't you think that some people are born with that heavenly gift of tact? Let me give a little instance along this line. The other day I received a letter from a lady—written part one day and part the next—and at the last she said, "Now I must close, for my little daughter is coming to call on me with her doll." I thought that was a good example of tact. The mother stopped what she probably would rather be doing—she would probably rather have gone on with the letter—but she stopped to entertain her little daughter who had come to call.

Mrs. Shattuck: This is true that some are born with this gift of tact, and some people are more demonstrative than others—we can acquire this gift of tact if we will.

Mrs. Jones: One thing more along this line. Is it not true, friends, that we are too apt to judge the conduct of our child from our own standpoint of view after our experience of a good many years, whereas they have had so few years of experience, and if we put ourselves in line with their point of view and try to discover the motive of what they have done we will know better how to deal with them?

Mrs. Shattuck: I read a story the other day which I thought was a good illustration of tact, of a mother who on a rainy day always brought out her desirable work—her quilt patching, etc., those with bright colors—and worked on them. She did not bring out the darning, patching, etc., but worked on something that was pleasant and cheerful to have around, and would give them pleasure on the dark day, which I thought was fine tact.

THURSDAY AFTERNOON, MARCH 2.

Session opened by repeating the Lord's Prayer in concert.

THE ART OF LIVING.

MRS. ALEX. CUSTARD, MENDON, ST. JOSEPH COUNTY.

Today, standing on the threshold of the past, we are looking through the open door of the dawning century, seeking clearer light, a broader view, diviner days and fuller sympathy.

Life is an ecstacy, if lived in knowledge. A succession of lessons which must be perfectly learned to be understood and how shall they be understood unless the art is taught?

Art is the skillful and systematic arrangement and adaptation of means to attain a desired end—the practical application of knowledge, natural or acquired.

That wonderful picture of the Transfiguration is art in its highest sense, yet produced by no rule. It was the ideal that God impressed on the soul of the artist, made visible through the senses, transferred to canvas by intuition rather than by acquired knowledge, for art is the revelation of the invisible reality. There is

NO ART SO DIVINE AS THE ART OF LIVING.

Art for humanity's sake. The only art capable of reproducing itself. The embodiment of ideals in flesh.

It is said that the spirit builds the house and afterwards the house confines the spirit, sometimes making it a prisoner in its house beautiful if the art of making spirit master is unknown.

The white robed "Benedictine of French Romance," once said: "The highest powers of the mind may be developed through simple diet and chaste living," and no monk under holy order ever lived a more chaste life than this celibate of the magic mirror while he wrote life as he saw it.

It is great to be a painter, to put upon canvas a picture of the innocent, beautiful child in life's springtime.

It is great to be a sculptor, and from the solid block of white marble to bring out the perfect semblance of the human form; but how much greater are they who mold and develop the human figure, the model. The world educates the artist and expects the home-builder, the molder of the artist's model, to work through intuition, yet it is known that God rarely makes a genius, expecting the rest of the family to be educated.

SKILLED LABOR NEEDED IN THE HOME.

There is no place where the skilled laborer is so needed as in the home, for family life is the foundation of the nation's life. When the art of living is understood, the product of that most important social institution, family life, will be a being nobly planned, who will discharge his duties nobly, being able to produce and maintain successful moods, exercise power without fatigue, living in the flowing current of progress in harmony, health and happiness. When shall this being live? When we, using the progress made in education in this century as stepping stones to higher life, work for the men and women of tomorrow, teaching them to use our efforts as mounts on which to rise to a higher plane.

Let us work for a course of study that will instruct them how to live more in accordance with the laws of health. We need a better digestion, more perfect assimilation of food. Strength of thought and will power are dependent on muscular development. Then educate brain, hand and eye. The alleviation of poverty is found in better industrial conditions, a larger knowledge of household economics. Statistics show that 85 per cent of the wages of the very poor are spent in food, to be wasted in preparing and so spoiled in cooking that nutrition is lost, and the craving appetite unsatisfied is unsuccessfully drowned in drink. The good cook is a factor in reform, an ally to temperance.

HOUSEHOLD ART IN SCHOOLS.

We may not be able to cure or reform the men and women of today, but we can work for those of tomorrow, by establishing a course of study in our schools in which household arts shall form a part. Supt. Ella F. Young, of Chicago, says that children trained in making useful things in school make better house and home keepers. Let us work for the teaching of household arts in our schools, that the seventh and eighth grade pupils may learn useful lessons. So many leave school ere they finish the high school or reach the M. A. C. to learn domestic science where it is so well taught. It is as essential to the nation's success that our girls should be instructed in house and home keeping as that they should learn the three r's. "Knowledge is power," is as true of home life as any

other life. Service in the home is divine. Woman's work is dear to God and can not be spared. Hearts, too, must be educated with brain, hand and eye, for "So intimate is the alliance of mind and heart that talent sinks uniformly with character."

Then as women let us do all in our power to have a course in general house and home keeping, teaching the love of service, economy and thrift put in our public schools. The art of living will be mastered sooner when what should be eaten and how to cook it is known; our nation stronger when women know the value of food particles.

Germany makes domestic science compulsory, as are the other branches, requiring every girl at 20 years to possess a certificate of knowledge in general housekeeping, that she may be able to preside with ability over the home she may be called upon to share. The arguments used to pass this law are well worthy of consideration. If every civilized nation would make and enforce this law it would bring about a gastronomic revolution, at least in America. But listen, there is a protest from the teachers: "We and our pupils are overworked now; we have more than we can do in the hours allowed for school work. We can do no more." They have enough to do, and when I look at the young army of pale, be-spectacled faces and thin figures that march out of the schoolhouse, I say, enough of brain work. It is time that parents add their protest to the teachers', and school boards listened, asking themselves the question: For what are we educating? Ought it not to be for life?

Every day the path of the bread winnner is narrower, more difficult to climb,

THE HOME KEEPER'S PROBLEM

harder to solve. Sooner or latter the public school must fit pupils for the store, shop, office, farm and home. So many leave school before the high school work is finished that the practical work must be done in the lower grades. Now comes the cry: "The curriculum is full, we must follow the course laid out, we are educating for the U. of M." I wish that were true, but it is not true of the masses. For every pupil fitted for the U. of M., there are one hundred who never finish the high school. In one county that I know well, statistics show that the number of graduates from seven high schools in the past 20 to 25 years is 785; of this number 545 from town, 242 from the farms. Ninety-five of these are college graduates. The per cent of high school graduates who are college graduates in this county, in the given time, is 12. Are we educating for higher institutions or for life?

For every child destined to live a life of ease and luxury, there are 100 who must enter the ranks of the toilers, and is it not for them that the public school ought to be maintained? In making a course of study, why not be governed by the demand? The object of the school should be to educate the children of the masses to a higher plane of living, teaching them the use of brain, hand, and eye.

Suppose every mind was well versed in book lore, with undeveloped muscles and unskilled hands, what would be the result? Each would try to live by brain work. How would they be fed and clothed? Necessity can invent crime as well as machinery, and the vices of intelligence are more dangerous than the vices of ignorance. The United States pays

more than any other nation per capita per annum for the education of the children, and yet we have today over 100,000 convicts held for serious crimes, proving that a more useful education is needed. Why should every course in our high schools require two years of algebra in order to graduate a student, and only one year at most of chemistry? Which is needed in life work? The agriculturist, the manufacturer, the housekeeper, all need a knowledge of chemistry, and use all they possess. Do they use their algebra? And yet unless they pass the required standing in that study the pupil may not have a diploma from any high school in our State. The human mind is not so constructed that two years in algebra are necessary in its development for practical life. This old world shall be transformed through symmetrical education. The fountains of learning opened by Athens shall be replete with the knowledge that shall reclaim the world.

The children of men shall walk in the light of wisdom. Then the sky will be brighter, the streams more silvery, the wooded hillside thornless, and there shall be no sting nor any evil things. No stone shall bruise the feet of those who walk in the path of duty, for it shall be to them a joy and love will be the law of life that has become beautiful through a perfect knowledge of how to live. The glorious light of that knowledge brings the wisdom that shall transfigure the race.

THE TRUE HELPMATE.

ELLA E. ROCKWOOD.

God's purpose in creating woman is distinctly made known in the second chapter of Genesis, where he says: "It is not good that man should be alone. I will make him an helpmeet for him." There seems to have been no thought of her living a life of independence or of having any existence apart from that of wife and mother. Yet how great has been the change in this respect when we have about 3,000,000 women in the United States today who are earning their own living, and a goodly proportion of them not only doing this, but supporting a husband and children also!

We hear much about the desirability and advantages of the life of independence, yet I believe there are few women, if any, who are satisfied with such a life. There is something inherent in woman's nature which likes to lean upon one stronger than herself. Deep down within the bosom of every daughter of Eve lies a longing for a home of her own, where love shall reign supreme and where, as wife and mother, she may fulfill the lot of womankind, that which God ordained for her in the beginning of the world. There is, in my estimation, no joy on earth which can compare with this, and as mistress of a happy home she is as truly in her proper sphere today as she was 6,000 years ago.

THE HONOR OF WIFEHOOD.

When a man asks a woman to be his wife he confers upon her the highest possible honor which lies in his power to bestow. Be it much or little, he offers her his all. Whether or not she accepts such an offer, it ought always to be considered as something sacred—too sacred to be

treated lightly, for it means a great deal to the man in the case, whether the woman realizes this or not.

Solomon, the wise man, tells in Proverbs what are his ideas concerning a model wife. Conditions have greatly changed since that time, yet much that he says holds true as regards the woman of the present time who would do her full duty as a helpmate to the man of her choice. It is not required of the wife of today that she spin and weave, but she needs to labor for the best good of her family as zealously as did the woman of Solomon's time.

The true helpmate will not be foolish enough to wear herself out trying to do the work of two women, thereby ruining her health, bringing sickness and perhaps death to the home. This is a mistaken view which some women have of being a helpmate. She will rather endeavor to be a companion, a counselor, a guide as well as a loving co-worker so far as her strength will permit.

It should be one of the prerogatives of the wife to be a helpmate to her husband in his business. Too frequently she knows little or nothing of this. She should be an advisor in all business transactions.

Intellectually most men need a little help. They need to be encouraged to read more, to keep abreast of the times in current literature and in a knowledge of passing events.

Spiritually women should ever lead the thoughts and lives of their husbands to higher planes. If it is true, as some affirm, that we as a sex are cast in a finer mold than our brothers, how evidently this duty devolves upon us. Let ours be the word to uplift, to elevate the minds of those around us. Let our influence ever be exerted for things spiritual, things pure and holy.

O! my sisters, is it not true that many times our ideals are considered in the light of impossibilities? We know how we ought to live, what we ought to do, then meekly acknowledge our weakness by going on in the old way. We should not only think more about our ideals, but we should try to attain to them.

Sometimes we get discouraged and we begin to think life isn't worth while after all. There are times when everything looks dark, times when we think whatever we do unappreciated. But we must not allow ourselves to get into this line of thought. Let us dwell more on the bright side of life; enlarge upon the pleasant things, forgetting those which are unpleasant. We must keep doing; there is no such thing as fulfilling our whole duty in life and living a life of ease. It is worth while to work for the happiness of others; to add in the smallest degree to the brightness of another's life; to speak an encouraging word to some disheartened one; to lift for a moment some one's burden; this is surely worth our while.

DIVORCE.

Now let me add just a few words about divorce. Shun it as you would the plague. There may be unhappy homes, but while a divorce will dismantle them and separate those who ought to be near and dear to each other, it does not always banish the unhappiness. I question if a woman who has once truly loved her husband can ever be made happy by a divorce, no matter how unworthy he may have been.

Some women make their own unhappiness when, if they tried equally as hard to be happy, they would be so. Be loyal and true, make the best of your life as it comes, try to be the very best wife and mother you can, and remember those solemn words, "for better for worse, so long as you both shall live."

"Into our lives and our own hearts
Shadows will some times fall;
But the sunshine never is wholly dead,
And heaven lies shadowless over head,
And God is over all."

DISCUSSION.

Q. How can this matter of divorce be remedied?

Mrs. Irma T. Jones: If we are wise enough to train our children to the responsibility of marriage—to the kind of man or woman they marry as the fathers and mothers of children unborn—it would obviate in a large measure the divorce cases.

Q. Is there anything in heredity?

Mrs. Sibley: Is heredity nothing? No. Let us be very careful how we think and feel toward the unborn child. If we desire to take the little unborn life, we are not sure that we shall not give birth to a murderer.

Mrs. Johnson: Where shall we look for strength; for help; for comfort?

Ans. To Christ.

Miss Louise Miller: So often we are too much engrossed with the physical—get all you can of the spiritual out of each day. Keep your ideals in view, and strive toward them; look to the highest and best. I would like to recommend three books which are very helpful: "In tune with the Infinite," "What all the world's a seeking," "All's right with the world."

Mrs. D. M. Garner: Can we always be sweet; always be strong; always be kind; always be neat?

Mrs. Rockwood: No.

Mrs. Campbell: We should educate our girls to be wage spenders as well as we educate our boys to be wage earners. Our criminal classes are increasing much faster than our population.

Q. How would you manage your husband, as his helpmate, provided he did not care to go into society and you did?

Mrs. Rockwood: I would stay at home with him.

Mrs. Wattles: How would you do if there was so much more work to do than you ought to do—than you could do? What is best to do?

Mrs. Rockwood: I would work as long as I could, then lie down and rest, for ten minutes at any rate.

Mrs. Watkins: Study what your child likes and dislikes before it goes to school. Study your children.

Mrs. King: Attend your school meetings.

Mrs. Hinds: Keep yourselves just as young as you can with your children. Never be too tired to go out when your husband invites you to go with him. Be a helpmate to your husband. Be a partner in your husband's business.

Mrs. Beardsley: Could we not leave out geometry in our schools?

Mrs. Campbell: Yes, unless you are educating for the University.

Mrs. Studley: Can we have a voice with the school board unless we can have a voice as to who they shall be?

Ans. Yes.

Mrs. Elliott: Who shall say where the line shall divide the necessary from the unnecessary?

Mrs. Garner: All natural sciences should be taught in our schools, but not higher mathematics.

Mrs. Jones: Could you suggest where we should begin to introduce manual training?

Mrs. Campbell: Begin with the women—the intelligent women—with those who have comfortable homes.

Mrs. King: What good has the study of algebra done us?

Mrs. Richmond: Is not algebra necessary to higher mathematics?

Mrs. Campbell: Yes, necessary; but how many use it in future life?

FRIDAY AFTERNOON, MARCH 3.

The session was opened by repeating the Lord's prayer in concert.

THE VALUE OF TRAINING.

MISS MAUD R. KELLER, DEAN WOMEN'S DEPT., AGRICULTURAL COLLEGE.

Of the infinite varieties of training, the two that have a special interest for us are home training and college training. It is only lately that any importance has been attached to the idea of training for women other than that necessary in fitting for the "professions" now open to women. We always have recognized the necessity of training, special fitting for the lawyer, the doctor. Public opinion demands it even in trades, in carpentry, skilled labor in factories, training in servants. Is it foolish then to ask a certain amount of training for women, who are to be home-makers, who are to follow, perhaps, the hardest profession in the world, one of gravest responsibilities?

CONSIDER FIRST COLLEGE TRAINING.

The woman who does not expect to teach or to enter a "profession" has come to college, come to stay. Since the beginning of the Christian era the idea of wife and mother has been adored, yet many of us have heard even teachers say, "She never will make a student, but no matter, she will marry, she is a dear girl, but does not amount to much." Wonderful it is that some scatter-brained girl who failed in everything else, awed by the majesty of her high calling has developed and grown into a fairly good mother.

The highest ideal of the mother has not been before us. This highest ideal involves "a power of rational and moral guidance peculiar to humanity to be used in the truly sacred work of lifting up to humanity that crude lump of possibilities, the child—for its accomplishment the mother, far from needing no especial ability and preparation, requires the most varied talent and the most thorough training. Many of us feel that.

THE BEST PLACE TO RECEIVE THIS TRAINING

for what is known as an every-day life, is the American College. It is offering special inducements to women students by offering some special courses and modifying some others. The first requisite for our women is that general education that men have before entering upon their special studies. The aim of the college is to give this general course, it is also to inculcate principles and to build character. There is definite teaching and indirect influence.

THE COURSE OF STUDY.

As to the definite teaching persons might not agree. I would demand mathematics. The practical knowledge is useful and the mental training in alertness valuable. There should be a knowledge of the English language, our medium of expression, and of some of the high thought expressed in it. I would ask for history; it is good to hold in one's mind the ideals of heroism we find in history; ideals, too, of chivalry, bravery,

courtesy. We become like what we admire. I would have music and science. In science I would make destinction between work done by the college man and the college woman, not in botany, physics, but in chemistry. I would demand chemistry applied to domestic problems. It should be the chemistry of food. At the Michigan Agricultural College girls are now analyzing nutritive values of certain foods. There should be the chemistry of digestion, and all this training in chemistry aiming toward healthier, better nourished bodies.

There should be in this college course teaching in sanitation, hygiene, anatomy and biology, the science of reproduction. Statistics show that this training may be taken without injury to a girl's health if she is judicious and has had any training in self-control in her home as to the indirect teaching. There is a resulting firmness, clearness of mind, accuracy, mental balance that goes to the making of a strong woman.

THE ADVANTAGES OF COLLEGE TRAINING.

(1) The college-trained woman has learned many hard lessons—not only how to get on with more or less distant neighbors, but with the girl next room who may annoy her in many ways. (2) The college-trained woman has learned to spend her time wisely. She has been cultivating wise judgment that may serve her in future emergencies. (3) She has gained a knowledge of her own powers, and limitations; she is surer of herself.

There is the training of the moral nature, the building of character inevitable in college training. Truth, honor, self-sacrifice, feeling for justice grow partly through public opinion. There are a hundred calls upon a girl's generosity and these warm-hearted girls respond graciously. In homesickness, loneliness, sorrows, joys, there is ample field for cultivation of these traits.

Why should women have this finer, higher development? Because as another college woman has put it, woman has the eternal commission of God to carry on His work—creation and education. Because most of the children today are taught by women; because whatever women's power may or may not be in politics she is making the ideals of our American citizens and saying whether they shall be clean and pure and above reproach. It depends upon the "skilled labor," the training of women who are to be teachers and home-makers and mothers what the standard of life is to be.

DISCUSSION.

LED BY MISS JESSIE H. SMITH, PONTIAC.

Any person physically, mentally and spiritually healthy wishes to live happily that life which is useful to themselves and others. The attainment of such a life of happiness and usefulness depends to a large extent on the realization of the best training for one's chosen life work. Notice, I say the best. for that training is not the best nor of permanent value which fails to teach how to live happily, and that with the least possible loss of nerve energy. In other words, I believe that loss of nervous energy is largely due to lack of proper training.

On account of our complicated civilization today we are mutually dependent upon one another. The isolation of the home, which we read of in medieval history, has been destroyed. The comfort or discomfort of one family is inextricably

interwoven with the comfort or discomfort of the community. Therefore, it is that women today as well as men—nay, far more than men—need and are seeking and demanding a training that they may live a true, full life.

I will limit my remarks to the value of training to the women who are the home makers. It seems to be just dawning upon womankind that the care of the household and of the children is a profession for which the best training is not too much.

What, then, is the training that the woman at the head of a home needs, and why? First and foremost, I believe she needs a liberal education. I would not limit liberal education to mean a college education exclusively. Travel with the right sort of companion may bring it. "But," you say, "that is just as far out of our reach as a college education." Then be content to live simpler and have some leisure time to spend on literature, music or art, and with refined, educated people. Some of the happiest, most useful women we know have been self-educated, and that, too, done largely after marriage, and often done with their children.

But of what value is this liberal education to the home-maker? First, it enriches the woman herself, hence the home. It hardly seems necessary to dwell upon this point. Even the child feels it. I knew a little girl who, when her mother was debating the advisability of taking a European trip and leaving her daughter with her grandmother, exclaimed, "Oh, yes, mamma, do go. You will be so much more interesting when you return!"

Second, the homemaker needs a liberal education to retain the sympathies of her children. How blessed it is that our admiration and love are based more on character than on education, but it is true that, other things being equal, we trust more, and so love more, those who are intelligently interested in our work. So the child will unconsciously be drawn more to the mother who has the knowledge which enables her to be intelligently interested in the child's interest and need.

Further, the wife and mother needs a liberal education that she may store up within herself resources for times of difficulty, loneliness or sorrow. An education gives one a perspective, a power of discriminating between the values of conflicting duties and attractions; between what is small and must be overlooked, forgotten, and what is serious and must be encountered, battled against; between what is but a passing attraction, a fad, the attainment of which is of no lasting value, and that which promises to be of permanent value, and so may be profitably striven for. With this power of discrimination she can throw off small disappointments. Large ones may be tided over by spiritual and intellectual resources within.

The fourth advantage which an educated woman enjoys is that it facilitates her in the acquiring of a special training. She may forget, and probably will, many facts learned in her study of history, mathematics and language, but her mind has been trained to do accurate work. Quickness of perception has been gained. These habits will be of great help in taking up domestic work. A college graduate, now wife of one of our State University professors, once said to me after her marriage, that although before marriage she had never cooked or performed any duties of a housekeeping nature, she had experienced no difficulties in managing her household. She attributed her success to her college training. I only half agreed with her, but I think there was enough truth in what she said to be worth the thought. A well trained mind takes up and masters any work easier than one that has not had the training.

I said that first and foremost a woman needed a liberal education. In addition to this, it is quite important that she have a special training for domestic life.

Under the special education comes, first, the training in cooking. One need hardly enlarge upon the joys and far reaching effects of a wholesome meal, appetizingly served by one who does it with perfect ease. Confusion and worry on the part of the server destroys the wholesome effect of the meal. Ease can only come from consciousness of good cooking which comes from training. Besides, a training in cooking, a training in elementary physiology and hygiene, is quite as important to the woman at the head of a home. The statement is made that five per cent of all children born in the United States die under five years of age; that it costs one hundred dollars to bring a child into the world in a family of the laboring class. This includes loss of labor on the part of the mother, doctor's bill, medicine and nursing. In families of a higher class the expense will be more. How important, then, it is that a child which costs so much in money and vital energy should be reared. The ignorance of parents is largely responsible for the great loss of life. No one is fit to be married till a good knowledge of applied physiology is theirs. A

mother must see that her children have wholesome food, proper clothing, regular exercise and regular rest hours.

If a woman is able to bring to her home the culture gained from an intimate acquaintance with literature, music or art, and a good knowledge of the more practical side of housekeeping, her influence will be far reaching, and the unhappy, useless life under such conditions would require a special diagnosis.

DISCUSSION.

Mrs. Rockwood: I would like to take an exception to that part of Miss Smith's paper in regard to the country schools. There may be instances where the pupils who come from the country schools are not so well advanced as those in the city schools, but I think our country schools far better than ten years ago, and I am very sure that the facts will prove that they are taking rank with the city schools.

Miss Smith: I don't mean to say that everything in the country schools is bad. I hope they are much better than they were ten years ago; I would feel badly if they were not. I attended a country school myself when I was young, and I sometimes feel that my time in the country schools was, to a great extent, wasted.

Mrs. Elliott: Why is it that so many of the boys and girls who go from the country take first rank when it comes to graduation? A large per cent of the graduates who are at the head of their classes are those from the country.

Miss Smith: They get the training after they enter the high school. I do not mean to say that the poor students are entirely from the country, but I do mean to say that the pupils we get from the country schools are not as far advanced in reading and writing as the pupils of the same age who have attended the city schools.

Mrs. Shattuck: I wish to quote what a superintendent said to me lately. He said that out of the children who enter the higher grades of the city schools the country children were better prepared than those who come from city schools.

Mrs. Hinds: I know instances where country boys and girls came out at the head of the class.

Miss Smith: That is true, but you must remember than in most cases you send us the best students from the country schools. In our freshman class, for instance, the only ones I have had to condition on passing were those who came from the country schools. We have found sometimes that in taking the examinations for passing into the high school from the country they do not pass them honestly and are not capable of doing the advanced work. As a whole, the country students were not as well prepared as those who came to me from the grades in the city schools. Often the ones from the country stand at the head at graduation, but you send us the best—you do not consider how many there are from the cities.

Miss Snook: I have enjoyed the papers very much indeed, but I would like to ask the question, how can the country children be expected to be advanced where we have five or six months of school, whereas the city children have nine or ten? The intelligence of the country children should not be be ignored. I do not think it it always the best who are sent to the city schools from the country, for many have to work and are never able to attend the high school.

Mrs. Elliott: I think it is fine, if with five or six months of school, country teachers can send as good students as they do to the city schools.

Mrs. Mary A. Mayo: The main question before us is—what do you think about college education for mothers—the mothers of the future?

Mrs. Alex Custard: I think, if it is a college education for women, it is the best thing a woman can have—if the college training is fitted for a woman's life. If she can get out of it what she ought to have. If she goes to a college where a liberal education is given—where a woman is trained as well in heart and eye as she can be—let every woman have a college education.

Mrs. Elliott: What food should we give to our children to make a well balanced ration? They talk about well balanced rations for stock, in the main meeting; now what would be a well balanced ration for a child? What should be put in a boy's lunch for taking to school, for instance?

Miss Keller: I think that question should have been asked when Miss Rushmore was here. It depends on the boy. But college students, or those attending school, should eat nutritious foods. I believe that half of the breakdowns that come from college courses come because girls are very careless about the things they eat, and careless about the manner of their life, and I feel that the college

is not responsible for these things. I think these things go back of the college training—these habits exist before students enter college. However, I believe in some cereal a good deal, so as to supply the brain power that students will need before dinner time. I think some good meat or egg should be eaten for breakfast. I can tell you, if you like, what we have for breakfast at the Agricultural College, in the women's boarding club: We have various kinds of cereals, cocoa, milk and coffee. (If girls like milk, it is good for them. In our college she is getting a training as to what foods are best, and when she knows this she must decide for herself.) We don't have meat every morning. On Sunday morning we have fruit.

Mrs. Condant: I took so much comfort from the paper by Miss Smith. I think she was misunderstood about the spelling and reading part, for in our country schools they are neglected. In my own home, for instance, the teacher came six miles to teach. He came over one morning and asked me to help him in an educational meeting which they were going to have that evening. I told him I could not, did not know how, and had not the time, but finally consented, and went over and helped what I could; and from that evening's meeting we have two fine libraries in the district. I think the reading and spelling, as a rule, in our country schools are very much neglected. I am glad that we are beginning to see that children must be properly educated in the lower branches to be fit to take the higher grades.

Mrs. King: As to the food that a child should eat, there are many who would not like the cereals. For myself, I would starve on them. I like meat, am very fond of it; it is not a good brain food, but fish can be substituted. The country children have the advantage that the city children do not have of the fresh air and plenty of exercise. This builds up good muscles and brain, and fits them for the education which they should get—builds the body up well prepared to receive intellectual food. A diseased body will have a diseased brain. I think the educational advantages in the country schools are far better than a few years ago.

TOWN AND COUNTRY CLUBS FOR WOMEN.

MISS KATHERINE M. INGLIS, ALMA COLLEGE.

Away back in the ante-diluvian period, when I first began to write school essays and papers for debating societies, we had a fashion of commencing our productions with "Emerson says." He was our fad at that time, and we felt that a remark of his was a good solid foundation on which to build the air castle of our impressions (we mistakenly called them our "thoughts") on any and every subject.

And "Emerson says" one thing which has been a source of courage and inspiration to me personally ever since I first read it. It is this: "With consistency a great soul has simply nothing to do." I might never have suspected my own greatness but for that. I have never seen any other sign of it, but measured by the Emersonian standard of my inconsistency it must be transcendent.

And I feel quite oppressed by my greatness as proven by my inconsistency in speaking to you on the subject of Town and Country Clubs for Women, because some two years ago I firmly resolved that the only society with the organization of which I should have anything to do would be a society for the cultivation of graceful leisure. For I found myself a member of the church, two study clubs, two missionary societies, the W. C. T. U., and a King's Daughters circle. I found myself a member of so many things, that I felt quite piecemeal and longed to be a whole, however small, and to do something as my individual self, and not in behalf of any organization. And at this point the idea of the Town and Country Club appeared on our horizon, and I at once ran after that as if it were the rainbow and I expected to find the pot of gold at its end. And more, I am here today to speak of the advantage of an organization like ours,

and if possible to so awaken your interest that other similar clubs may be organized.

And I hope to prove also that my inconsistency is in part at least only apparent, not real, and that in the Lapeer County Club is realized to some degree my ideal of a society for the cultivation of graceful leisure.

It is trite to say that civilization is organization, quite as trite to say that this is an age of organization, and perhaps most trite of all to call this the "woman's age." It is every one else's age too, the inventor's, the explorer's, the missionary's, the workingman's; we women are perhaps apt to overlook that. But that this is

AN AGE CONSPICUOUS FOR WOMEN'S ORGANIZATIONS

may be trite, but it is also true, a virtue which every trite remark does not possess.

And whatever may be the abuses of organization, and they are many, the root of the matter lies in this, that we have learned to believe with Edward Everett Hale that "apart" is the saddest word in the English language, and "together" one of the most blessed.

So when women organize for mutual aid in individual development, if they are in earnest, they must of necessity cultivate certain virtues from the very nature of their work together. A good club woman must be unselfish, reliable, and prompt. Planning for the good of the club she learns the value of self-renunciation; she learns what Plato meant when he said "the soul of philosophy is love," she learns that the development of the individual is so far the development of the race. The shy woman who offers her quota to the entertainment of the club when asked to do so, and the efficient woman who urges her timid associate to do the work required though her fingers are tingling with desire to do it herself, each work out the same problem by a different method, and both learn a valuable lesson which could only come to them from association with each other in some organized work.

It may be said that women learn self-renunciation in their own home and home life, and this is true, but after all is not the unselfishness we give to our own, because we love to, simply a higher form of selfishness? Does it really form the altruistic and broadening virtue of self renunciation for a cause and a community?

Then another virtue learned in club work is the

DOING AWAY WITH CLASS DISTINCTIONS

and social and sectarian prejudices. I know of no other place where a woman stands so entirely on her own merits. She may have wealth, beauty and social position, and if she have brains all these things will add to her prestige in the club, but if she have not brains they count for nothing. And the woman who has brains may have none of these, she may even offend some of our dearest prejudices, she may not belong to our church, we may not meet her socially except at the club, but let her prove herself a woman who thinks, and our lives are just so much the richer, not only by what she teaches us, but by the interest in, and respect for herself which she has awakened in us, and this would in all probability come to pass in no other way than in club work.

And then the club ought to be and generally is a place in which to receive uplifting inspiration. The trouble with most of us is that victuals and drink are the chief of our diet, and our minds and souls starve, our minds perhaps even more than our souls. Now at this point I realize the limitations of organization, I realize that no club can make up for individual scholarship and culture, that the most that can be done is to offer mere stimulation. There is a phrase I am fond of quoting to myself in my own special work. "The teacher can only ring the rising bell in the dormitory of the soul." But granted that this is all and if some new thought or ideal awaken and rise to new life and service, isn't it something to be glad of always that one was allowed to ring the bell. And isn't it a blessed something to give to others the result of our own individual labor, and to receive the result of theirs. It is truly more blessed to give, but that's not saying that there is no blessing in receiving.

So to me, the case for women's clubs lies in their furnishing ground for the cultivation of special virtues, the abolishing of caste and prejudice, the rendering service to our ideal needs. We may not change the general course of the world very perceptibly, we may have to meet the sneer that so far the woman's movement has produced no great specialist or towering genius, but after all the world does not need the great specialist or towering genius, nearly as much as it needs "the quiet faithful work of numbers of apparently commonplace people, who unnoticed are moulding it into better ways."

And now I would like to tell you why, to us who are interested, our own special organization seems to have a certain qualification for the needs of certain conditions.

OUR CLUB,

the Woman's Country Club of Lapeer, is essentially a social one; its prime object is the cultivation of acquaintance between women in the town, and those living in the country. And for this purpose we meet once a week to enjoy a pleasant hour together. We have the least possible machinery of organization for the best possible results, I think. We have the usual officers, president, vice president, secretary and treasurer, and six other ladies are elected to act with these officers as an executive committee. All matters pertaining to the welfare of the society are discussed and acted upon by the committee and their action is approved by the society before being carried out. We find that this economizes time and friction and gives us more of our precious hour for matters of more general interest. The general officers and this committee are elected for a year, and we have, besides, two committees, one on program, the other known as the social committee, each consisting of three members. These are elected every three months. It is the duty of the program committee to furnish some entertainment for every meeting, except the first one of each month, which is the special care of the social committee. This committee is allowed a dollar a month out of the treasury, and they furnish such light refreshments as they can for this amount. They also furnish the feast of reason which is perhaps on the whole less formal than on other days. National holidays are often observed on this social day. The program committee has, perhaps, the hardest work, but they have the advantage of being hampered by no plan of study, and of being able

therefore to use all available material. If anyone has a special hobby or fad, he or she has the opportunity of presenting it to the Country Club by invitation from the program committee. If an affair of National import fills all our minds, the program committee appoint a day to have it discussed in club. We have had talks from clergymen, doctors, lawyers, business men and teachers. A banker tells us how to take care of our money, an electrician tells us why we do not need to be afraid of lightning, the superintendent of schools tells us from his point of view what the home influence does for the child in his school work. If any of our number goes to a convention of any sort, which is of general interest, whether missionary, or temperance, or political, or to the Federation of Clubs, she is invited to share her pleasure and profit with us on her return. When a new book rouses the interest of the people at large, we have a review of it.

Our programs may seem rather heterogeneous, but we have decided that for the present at least this answers our purpose better than having a course of study, or even of lectures on any one subject. Our members keep about the same, but the personality of each audience changes. This is easily accounted for. A member comes into town one Saturday, and perhaps the roads or home duties prevent her from coming again for two or three weeks. If we had a course of study she would feel perhaps that she had lost too much time to ever overtake us again, but under our present method she comes as if she had never been away. This year we have followed a little more of a plan, having had a travel course, but even this has been very loosely interpreted. Any one who has taken a trip anywhere in our own or other countries has been asked to tell us about it. Another feature of this year's work has been the giving of ten minutes in each session to an account of some famous picture and its home. We have also a question box in which all sorts of information is sought after. The questions ranging from how much soda to use with sour milk to who was Adam's first wife.

Every woman in Lapeer county is elegible for membership in the club. Our dues are forty (40) cents a year, or fifteen (15) cents a quarter, if one prefers to join in that way. The supervisors have given us a pleasant room in the court house, and we have papered, carpeted, and furnished it simply, but prettily. The only objections to our quarters is that they are rather small, sometimes much too small for our audiences. At such times we can usually adjourn to the court room above. We are more and more convinced that a club where women, who do not come in contact with each other in other ways, may meet together, simply for social pleasure, and for rest and amusement is a good thing in these days of much study and many books and general weariness of the flesh.

We have found that we return to the round of daily duties, refreshed in body and mind, after an hour spent in exchange of ideas on some outside topic, and we have learned that a good working principle for club or individual is to think on and talk of the things that are pure and honest and right, and true and lovely and of good report.

DISCUSSION.

Mrs. O'Dell: I am a member of the Ladies' Town and Country Club of Lapeer. I feel that every town or village should have these organizations. It originated

with us two years ago, at the County Institute. In this club we are often able to bring out latent talent that would not otherwise have been brought out. We have a very informal program—taking up different current topics, etc.—and the ladies bring their sewing and sew while we talk. By having this informal program, instead of some set line of work, a woman does not feel that she has lost so much of the programs that she can not come back and take up the work if the roads have been so bad, or some of the family sick, or something of that kind so that she could not be there for two or three weeks. As our sister has told you, it is the simple program which does so much good. I hope that the ladies will become greatly interested in this subject, and that many town and country clubs will be established.

Q. Are there many of these clubs organized?

Miss Inglis: We know of none but our own.

Mrs. King: We have a club, but it is the usual woman's club, and not like this.

Mrs. Bunting: We have four literary clubs in our town.

Mrs. Mayo: Do you reach out and take in the country women?

Mrs. Bunting: No, but the club of which I am a member has the circulating libraries.

Miss Snook: I represent the Rochester Woman's Club, which club expected to attend this meeting this afternoon in a body, but on account of the storm, have not arrived. I know they will be greatly disappointed, as they desired very much to be here today.

We have no club of the country and village women together, but there are quite a good many ladies from the country in the club.

Mrs. Kessell: We have had a very nice club for several years. Have taken up the study of English literature, etc. We are now studying the American authors. We are very anxious to have all the country ladies join us.

Mrs. Mayo: Do you make a special effort to get the country women in?

Mrs. Kessell: No.

Mrs. Perry: How many members has the Lapeer County Club, and how many of them are women from the country?

Miss Inglis: Last year we had 85 members, and a little more than half of them were women from the country. Our attendance would not average more than about half the number of membership.

Mrs. Mayo: Are half of the ladies present from the country:

Miss Inglis: That depends on the weather and the condition of the roads. When the weather and roads are good we have a large attendance from the country.

Q. Are your meetings held in the day time or in the evening.

Miss Inglis: Our meetings are held from half past two until half past three; sometimes in the summer, when the days are longer, we hold them from three to four. We have found it a good plan to close promptly on time; our sisters from the country say it makes it much easier for them to come if we close promptly on time.

Mrs. Perry: Are not your club rooms kept open all day on the day of your club meeting, so that the women can wait there, etc.?

Miss Inglis: Yes.

Mrs. Mayo: I would like the privilege of saying to you women that I think the city club needs the country women, and the country women need the city club. I know there is a great longing among the women of the country to join these city clubs. The city clubs, as a usual thing, freeze the country women. I was invited once to attend a city club of women. I went, but when I arrived they spoke to me, it is true, but not one reached out a hand of welcome and said she was glad to see me. In this way they freeze the country women out—they are not cordial enough. This club asked me why I thought it was that the country women did not join their club—they had been invited to do so. I told them just the reason—that they were not cordial enough to them—did not welcome them enough. You must reach out the hand and give the kind word; these country women are retiring women, and, as a general thing, you will be surprised when you get them in the club to see the amount of latent talent there is among them. There is an imaginary wall —purely imaginary—but very strong, between the town and country women, and we each help to build this up. The country woman feels that the city woman thinks she is a little bit higher in a social scale than her country sister, and the city woman feels that the country woman is a little lower in the intellectual plane than herself. They do not understand each other.

CONSECRATED PARENTAGE.

MRS. BELLE M. PERRY, CHARLOTTE.

This address appeared in the Institute Bulletin for last year, but the theme is so worthy attention, the treatment of it here so noble, it seemed wise to reprint it, especially for the thousands of new members of the Institute Societies.

Perhaps the greatest address given at that notable congress of mothers in Washington two years ago, was the one by Professor Elmer Gates on consecrated parentage; and I wish you could all get a copy of the proceedings of that congress, where you will find this address in full, and would read it again and again till these vital truths are built into the fibre of your being. I give a paragraph from it:

"Oh, the great and glorious task of parentage! It seems to me the most responsible position in which a man and a woman can be placed is that of begetting and rearing a child. * * * It seems to me that the religion of the future will center closely around the conjugal life and the cradle, and that science, art, and philosophy will be content to bring their fairest gifts to the hymeneal altar. The mother must be enthroned not merely in our love, but she must sit enthroned over the weal of the incoming generation. * * * I believe no possible training after the child is born can equal in importance what can be done before birth. * * * The incoming generation looks to you to be well born. It is seen to be a fearful responsibility to bring into the world a human being when we realize that we have it in our power to direct for weal or for woe the intellective and emotive character and moral disposition of the child yet unborn and uncreated. * * * A wife's love is something for which a man will strive; therefore let the wife give her creative love only when a man is worthy of it, only when he has for some months at least been leading a noble, courageous, and unselfish life. * * * A wife can control this fountain of life; she can grant her privileges only for worthy motives, and any man worthy of them will lead such a life as to deserve them. To produce great persons is the divine task of parentage."

I am glad we have so many noble men enlisted in

THIS GREAT WORK OF ENLIGHTENMENT.

In our own State today a consecrated man is going about and reaching thousands who have gathered from his addresses their first knowledge of the fearful responsibility of parentage, the sacredness of the creative functions, and the appalling heritage of crime and disease which we ignorantly bequeath our children. At a Sunday afternoon meeting in our town fully four hundred of our leading men arose as one man and pledged themselves to a higher manhood and received the pledge card of the Knights of the Twentieth Century, whose motto is: "One code of morals, temperance, and purity for men and women." On this same pledge card were ten rules of conduct, one of which was this:

"Thou shalt not excite or indulge the reproductive functions—whether married or single—except for the divine purpose of creating a new life."

I know that to the majority this is a new interpretation of

WHAT CONSTITUTES PERSONAL PURITY.

People have accepted it as the proper moral code for the unmarried woman, and possibly for the unmarried man; but custom has sanctioned in marriage what God pronounces wrong—the prostitution of the most divine powers conferred upon the children of men, and the eternal laws of the universe cry out against it.

To man they say: The old doctrine of physical necessity, with its appalling sacrifice of womanhood, is a libel on the Creator; the forces wasted in gratification in marriage or out of it, if conserved in the system will build the finest body and brain power; the person of woman is forever her own; this law trampled under foot by unenlightened passion has visited an appalling heritage of woe upon the race.

To woman the eternal laws of God say: Though you have the leadership of great-hearted men who are bringing the influence of their best manhood and the truths of science to your aid, yet the great work of redeeming the world from this weight of woe and ignorance is yours.

"But, oh, tell me the way out and teach me my duty," says the mother-heart of the world, and that cry is a call to enlightened and love-guided womanhood to shed wide and broadcast the larger light which illumines their way.

Light, and love and loyalty to God and loved ones must be the motto of any woman who would know her duty. The cry is for light. As Hugo says, "The only social peril is darkness." Light alone will dispel the darkness. And light will yet prevail. Deep down in every human heart is the image of God.

"So, underneath this cloud of sin,
The heart of man retaineth yet
Gleams of its holy origin,
And half-quenched stars that never set."

THIS IS THE HOPE OF THE RACE.

We can hold fast to that. "If the vile sand which you trample under foot be cast into the furnace and allowed to melt and seethe," says Victor Hugo, "it will become a splendid crystal." This is another way of saying that evil bears within itself the seeds of its own destruction, and out of the mire and grime of perverted good, which all sin is, tried in a furnace of pain and unhappiness, shall yet come to the race the splendid crystal of personal purity and consecrated parentage.

As I have said, the great bulk of the work must fall upon woman. And she must begin with herself. The first great step is to come to the right mental attitude upon this subject. If one has lived under the shadow of the old thought, as most of us have, it will be the work of months, perhaps years, do the best we know, to eradicate the old thought-taint which these years of ignorance of God's fixed and eternal laws have entailed upon us. When the right attitude of mind has really come we will know, and be sure it has not come until we have a deep and abiding sense of the essential sacredness of the reproductive functions in man and woman, till we see God himself in reproduction.

When this mental state is reached the hardest part of the work is done, and the forces of the universe are in league with us. Let me illustrate: Take a tuning fork in each hand. Strike one. If they are tuned

to the same tune it is but a moment till the vibrations have communicated themselves to the other fork and it will give the same tone.

This law of vibrations is all inclusive. Let your heart be tuned to consecrated parentage and conservation of life force and that image of God which is enshrined in the heart of your husband, in all manhood, and which is the hope of humanity, will vibrate to the same tone. It is woman's work to bring out the image of God there. Love and wisdom will lead the way.

THE THIRD AND LAST STEP

is the work with the children, and this is the work which will bring rich returns. When the mental attitude is reached of which I have spoken, a mother will know how to instruct her child. My heart goes out in sympathy to everyone who goes wrong through a perversion of their reproductive powers, whether old or young, for I believe that every child can be saved to personal purity by right instruction. And when our boys are rightly taught of the sacredness of the power to create a life, a chivalry toward woman will grow up among men of which the world has not dreamed and crimes against woman will be unknown. And in that glad time parentage will be recognized as having divine powers and responsibilities, the woman, as Frances Willard has expressed it, "will be only God's and her own—free, to whom shall never come the annunciation of her highest office and ministry save from the deepest intuitions of her nature responding to the voice of a love as pure and a purpose as sacred as her own."

DISCUSSION.

Mrs. Mayo: I always feel when Mrs. Perry has read her paper that I wanted to just think it over, and say nothing, but there are some who do not feel this way, and if there are any questions, Mrs. Perry will be glad to answer them.

Mrs. Hickman: How old should a child be before this knowledge of the origin of life be conveyed to them?

Mrs. Perry: I think the preparation can hardly be made too early, even before the child can ask questions.

Q. What is the best literature along this line?

Mrs. Perry: There are several good books. I think that the "Song of life," by Margaret Morley; "Teaching of Truth," and "The Birth Chamber," by Dr. Mary Wood-Allen, are among the best. The two latter can be obtained from Dr. Mary Wood-Allen, care of Wood-Allen Pub. Co., Ann Arbor, Mich.

Mrs. Mayo: Any one wishing a copy of Mrs. Perry's paper on "Consecrated parentage" can purchase it by addressing Mrs. Belle M. Perry, Charlotte, Michigan. She has a few copies with her here today. They can be obtained at the small price of two copies for five cents, or three cents per copy. This is just enough to cover the cost of printing, but there has been such a demand for a copy of this paper that Mrs. Perry has consented to have it printed and sold at this small price.

Voice: Another excellent book along this line is "The evolution of woman," by Eliza B. Gambol, of Detroit.

Q. How would you impart this knowledge of the origin of life to a child?

Mrs. Perry: The first thing a mother needs to do in this line is something that has to be worked out from within. A mother needs to think and read, and these books that have been suggested today will be a great help to her in teaching her how and when to do this. I cannot tell you just how this should be done, but when you have thought, and read, and prayed, and have come into the right spirit yourself you will know it. If any one wants to wait until the close of this meeting I would be glad to give her my own experience.

Miss Miller: I will just give you my experience with the class of children in the eighth grade in the public school. I had forty, ranging from twelve to sixteen

years of age. I took as a basis for my teaching the "Song of Life." I began with the very lowest plant life, and traced the evolution of that life. First I told the children that every organism, whether plant or life, has two great principles: the first, food getting, and the second, reproduction. That food getting, in a way, was selfish to the individual; and that for the second principle the individual must be as perfect as possible. I took, for example, the tree and told them that if it was to bear good fruit it must have good sunlight, air, and proper nourishment; but if any accident had happened to the tree in any way it might be nice on the outside, yet in the interior the tree was bad. Then I appealed to them by their own experience, and told them that if they did not take good care of their bodies, or got into any bad habits, that it would affect their lives, and others that would follow them. In all this talk I only saw in one child's face, a boy of about sixteen, a self-conscious look, but I simply ignored that, and it soon disappeared. I am sure that if you will follow this book, and the use of plant life, you will help your children very much. You know if you teach a child to walk you will not have to teach him to run—get him started in the right direction in this line and he will be all right. This creative force we have might just as well be used for creating good ideas, good thoughts, as the base use, and we should teach this to the children. It is this energy that has produced the best art, etc.

Mrs. Perry: I want to urge those mothers who are interested in this thing, and want to know how, to buy a copy of this book of Margaret Morley's. Dr. Mary Wood-Allen's books are fine, they are wonderful; but of all the books I have seen on this subject I think that the "Song of Life," by Margaret Morley, is the best. It is a book that will be read with absorbing interest by children. It will do a great deal to drive out this false idea of the purity of this thing, will do more in this direction than anything I know of. I wish I had a large number of this book to give away. Any one who reads and studies this book will not have to ask "What shall I do?"

Q. Can this book be secured from any book store?

Mrs. Perry: Yes, through almost any book store; or you can order from McClurg & Co., Chicago, Ill.

LOCAL ADDRESSES AT COUNTY INSTITUTES.

As last year, we have tried to obtain from each County Institute held during the past year, an abstract of one of the best addresses delivered at the main session of the Institute, as well as of one given at the Woman's Section by local speakers. We regret that some of the speakers have failed to respond to our request. But we present a series of abstracts containing valuable and interesting reading, and comprising one of the most important portions of our report.

THE INFLUENCE OF HOME TRAINING AS SEEN IN THE SCHOOL ROOM.

MRS. MARGARET LA CHAPELLE, Harrisville, at Women's Section ALCONA COUNTY Institute, Harrisville.

How often we hear the anxious mother say, "My child is so different since he started to school; he is so rough, and is not contented at home, as before." This is true to a certain extent, but is the school entirely to blame? Every child is a factor in the great school of children, and if your child goes to school with good habits well formed, he will help to make the school better.

A child need not be in the schoolroom more than two days before the teacher can judge something of his home training, although his parents may be total strangers to her. A child who has been taught to obey at home will obey willingly at school. And right here we might say that many children will obey their teacher when they disobey their parents. Why? Ask yourself. Children who are allowed to do their work in a slovenly manner at home are the ones who have their desks always in disorder and their books dirty and thumb-worn.

Another thought regarding neatness is this: I think many parents commit a sin for which they will have to answer when they allow their children to go to school with dirty hands and faces. Of course the teacher cannot allow them to remain in the room in such a condition, and they are sent to the wash basin and thus are subjected to the ridicule of the rest of the pupils.

THE HABIT OF NEATNESS

is or should be formed in the home and fostered in the schoolroom.

In regard to a child's literature, the home exerts a great influence. If the parents are careful in the selection of reading matter for their children, the teacher's work will be made more pleasant and the child will receive more benefit. A few days ago a little girl brought a large book of poems to school to show me what Santa Claus brought her, and she was so pleased as she pointed out to me poems written by Longfellow, Whittier, etc. Do you not think she will cultivate a love for good reading by forming the habit so early in life? On the other hand, I have pupils who have no desire to read "Evangeline," "Snowbound" and other good selections, because they have been allowed to read trashy literature in their homes.

In regard to manners—if a child is not taught to be mannerly before he goes to school, it is much harder for him and for his teacher. Not long since, I was compelled to remind a large boy that it was not mannerly to wear his hat in the house.

He looked at me and blushed as I spoke. Do you think he had been properly taught at home? Respect for the old, kindness, love and reverence are first taught in the home and are continually being taught in the schoolroom, if it is presided over by a true teacher.

As a teacher of considerable experience I have always found that the pupil who is the easiest to govern in the schoolroom is the one who has had

GOOD TRAINING AT HOME.

A child's surroundings in his home have so much to do with his work in the schoolroom. A child who comes to school in the morning with his mother's pleasant goodbye still ringing in his ear has more courage to begin his work for the day. And then his dinner—if he carries a cold dinner to school he deserves a good one, and why should he not look forward with pleasure to the opening of his dinner pail or on seating himself at the table after a short walk in the open air?

When school closes for the day he should be able to go home feeling that he will be welcomed and not to hear his mother say, "Oh, dear, you are so noisy; I always dread to see school close!" The evening should be spent in study or games of a harmless character, and not on the street. I believe if every child would sleep from eight to ten hours each night we would not have so much trouble in the schoolroom. So many parents allow their children to spend the whole evening on the street and then wonder why they get along so slowly with their studies. So many, many times the teacher and school receive all the blame, when, if the parents were to stop for a moment and look at the training the child receives at home, they would cease finding fault with others and do more home training. Some parents find it necessary to punish their children quite often to secure obedience, but if the teacher is compelled to punish them, the parents think it is unnecessary and in a great many instances take sides with the child against the teacher.

In conclusion I will say, parents, train your children as well as you can at home, and then co-operate with the teacher in her efforts, and God will reward you. Let the influence of your home be a good influence that will raise the moral standard of the schoolroom.

FARM HOME ADORNMENT.

MISS GRACE TAYLOR. Douglas, at ALLEGAN COUNTY Institute, Fennville.

Adorn means more than to decorate or beautify. As one writer puts it, "Adorn is more lofty and spiritual, referring to a beauty which is not material and cannot be put on by ornaments or decorations." It is with this thought in mind that we must furnish our homes. Make the kitchen as pleasant as any room in the house. If possible, have one window face either the rising or the setting sun. The swift change of thought and the inspiration gained from even casual glimpses of Nature in her morning or evening greeting will surely infuse one with courage to go forward.

Then have the flowers (for we all do have flowers) within easy range from this room's door or windows. Should the care of annuals be too fatiguing, have a few perennials; phlox, peonies, Japan Iris, dahlias and chrysanthemums. Any of those have been so improved of late as to give endless shades and various colors. If cost of plants is an item to be considered, go to the woods and there find the hepatica, spring beauty, violets, ferns, wild asters, gentian and goldenrod, thus obtaining a succession of bloom well worth the time and trouble.

IN THE HOUSE.

If possible, have the kitchen walls painted some light neutral tints, thus making a permanent finish and one easily cleaned.

In selecting wall paper for the living rooms, choose those that are cheery and light, and that also harmonize with the furniture already possessed. Pictures look better on light colored walls. Low walls should have narrow borders, or, better still, have the molding placed in the angle of ceiling and wall. In bedroom papers, avoid all endless patterns—those so interlaced and intertwined as to have no resting place for the eye. In cases of illness this is often an important feature. Vivid,

gaudy designs should be passed by always, as they detract from other furnishings.

In pictures, select such as will prove to be good friends, those that will appeal to our varying moods, and for the hasty glance give back to us a pleasant thought, a sense of peace or the strength of renewed hope. From the special offers of such magazines as the Art Interchange, one can get at a slight expense copies of paintings by well-known artists, landscapes, flowers, figures or water scenes, carefully finished as to color shadings and truthfulness to nature. Rather than use poor colored chromos, substitute black and white views from some of the leading magazines.

Exercise care when selecting furniture, by choosing such as will readily part with its coating of dust. Elaborate carvings are beautiful in their places but are not beautiful when covered with dust, and we do not crave extra care.

Avoid fads in fancy work. Choose that which is beautiful in itself, and be careful not to clutter the rooms.

For the front of the house there is nothing finer than

A SMOOTH, WELL-KEPT LAWN.

Save a few of the native trees, or, if too late for this, plant some, placing them at the sides instead of in front of the house, near enough to give shade but not so near as to exclude sunshine. Hide unsightly small buildings with a screen of shrubs, collected perhaps from the woods and swamps near home. An open kitchen drain may be successfully hidden by a row of hollyhocks. Have the heaviest planting on the side of the prevailing winds, always including a few evergreens to give color in the winter. Study the surroundings and leave openings towards the attractive spots—the beautiful knoll, a neighbor's house, a brook, or even a native tree. Remember that these trees and shrubs will last long after we are forgotten, always testifying to our taste and care.

HANDLING THE CORN CROP.

JAS. WILLIAMS, Bellaire, at ANTRIM COUNTY Institute, Bellaire.

As it requires the most labor to harvest of any crop that we raise, I have aimed at lessening the labor and also saving time, and my method is within easy reach of any farmer. First, in getting the ensilage corn to the cutter, I use a pair of low trucks, covered with a long platform projecting over and even with the outside of the wheels. Upon this we place rope slings long enough to reach across the platform, having a loop in each end of the sling and using two ropes for each slingful, placed at a distance apart to property balance the corn. An economical arrangement of the barn will do away with expensive machinery, so that the cutting and elevating of ensilage corn, and all other feed that is to be put through the cutter, should not cost more than sixty dollars.

THE CHEAP POWER ON THE FARM

is the horse; so we locate the cutter on a platform near the top of the barn, and just at the edge of the silo. Just behind the cutter I have a large vat which will hold two loads of corn; from the top of this vat is an inclined plane running to the floor, also two ropes running to the floor with hooks on the lower ends to hook in loops on slings under the load. I have two pulleys fastened to the roof of the barn and directly over the vat. The distance apart of ropes and pulleys will depend on length of corn. But from three to four feet will be about right. Now take a rope, the doubled length of which will reach from the opposite side of the load (from inclined plane) to pulleys at roof; now run each end of the rope through each pulley with a hook on each end of the rope, and hook to loop on other end or sling ropes on load; now fasten a rope to the bite bow end between pulleys, reaching from there to floor pulley and team, as for hay fork. You now have a continuous rope, and the team will roll the corn up the inclined plane and drop it in vat by cutter. A load divided into three slingfuls can be unloaded, after a little experience, in about five minutes. I use a two-horse power and a No. 2 Cummings cutter, which with the above arrangement, are sufficient for a 160 acre farm. All elevating is removed from the machinery, and this places the silo within reach of a great many farmers

who could not otherwise afford it. The cutter and power are stationary and are always ready for work.

FOR HANDLING THE BALANCE OF THE CORN CROP,

(which I have put up in sixty-four hill shocks, yielding this year an average of two and a half bushels to the shock) I use the same trucks and platform as for ensilage corn. Upon this is erected a tripod with a horizontal circle on the top to support a swinging crane; the cap of the crane has a pulley wheel mortised in each end, and another wheel at the foot of crane in platform on line with hub of truck wheel. I now take enough slings for each shock in one load, slings made with a ring in one end and a loop in the other end, and long enough to pass around the shock below the center, passing loop end through ring. Hook loop to hook on crane rope, take one turn of crane rope around rear hub of truck wheel, hold taut, and drive to next shock. By that time the shock is high enough to swing to any part of load, when by slackening on rope around hub the shock drops to place. Unhook from sling and hook to next shock, leaving sling on loaded shock for unloading. In unloading we attach hay fork rope to slings on shocks and run to any part of barn desired, removing slings for next load. Two fourteen-year-old boys with a team will do the whole work.

With a track in the barn all feed can be run to the cutter with the hay fork or slings, and a spout will conduct the cut feed to any part desired. We have cut our feed for the last thirty years and find this arrangement satisfactory, as the whole work is done with the ordinary farm help.

No feed should be sold from the farm, but should be used thereon to create a finished product. This system will keep the farmer on the farm, and also his sons and daughters.

SUGAR BEETS.

S. R. HOOBLER, Saganing, at ARENAC COUNTY Institute, Au Gres.

The following are the field notes of my experience for last season:

Plat 1—¾ acres—clay loam—sowed May 8, yield 628 bushels or 15 ton 14 cwt., gross return $73.80, net return $37.50, or $46.60 per acre.

Plat 2—⅜ acres—sandy loam—sowed May 20, yield 200 bushels or 5 tons, gross return $23.50, net $11.25.

Plat 3—⅜ acres—sand—sowed June 10, yield 107 bushels or 2 ton 13 cwt., gross return $12.45, net $2.45.

Entire crop—1½ acres—yield 935 bushels or 23 ton 7 cwt., gross return $109.75, net $57.15 for the 1½ acres, or $38.00 per acre. He estimates 20 days work to harvest an acre, 10 days to thin and weed same, and says it will take beets 140 days to mature.

CHICORY.

JOHN EGAN, Essexville, at BAY COUNTY Institute, Bay City.

It is an old saying that we must take the bitter with the sweet, hence the subjects of sugar beets and chicory naturally go together. The farmers of Bay county and vicinity have reason to congratulate themselves on the fact that both of these industries are firmly established here. The fact that three large chicory plants will be in operation in Bay City during the coming year ought to be sufficient to induce farmers to give chicory raising careful consideration.

The first question that will naturally be asked is, What kind of soil is best adapted to growing chicory? Speaking from my own experience and from facts obtained from others, I answer that clay loam gives the greatest yield; but when the cost of cultivation and harvesting is considered, a black sandy loam or muck will give most profit. The piece of land I sowed last year consisted of three kinds of soil—a heavy clay loam, a black sandy loam, and a light sandy ridge. The clay loam yields at the rate of ten tons per acre, the black sand 9 tons and the light sand 8 tons per acre. The soil should be thoroughly pulverized and made as smooth as

possible, as the seed is very small, being about the size of a carrot seed. The seed may be sown any time between May 10 and June 1. If sown too early too many of the plants may run to seed and will not be accepted by the factory. I drilled the seed in rows 12 inches apart with a Planet Jr. garden drill, using 1¼ pounds of seed per acre. In about three weeks after sowing the plants should be thinned out to about 6 or 8 inches, being sure to leave but one plant in a place. The success or failure of the crop will depend in a great measure upon the thoroughness with which this part of the work is done. If the plants are left too thick, especially if they are left in bunches, the crop will be a partial if not a total failure.

Harvesting may be commenced about September 20, and can be continued until the ground freezes. Frost does not injure the roots while they are in the ground, but a severe frost will injure them when freshly pulled. A light covering of earth will protect them through the winter. The best plan yet discovered for harvesting chicory is to plow a deep furrow as close to the row as possible without cutting the roots. Then pull the roots, twisting off the top as they are pulled.

I submit this statement as the cost of raising an acre of chicory:

COST.

Preparing soil	$2 50
Seed	1 25
Sowing seed	75
Thinning and weeding	10 00
Hand hoeing once	4 00
Cultivating three times with hand cultivator	3 50
Harvesting	10 00
Hauling three miles	5 00
	$37 00

RECEIPTS.

9 tons at $7. $63; net profit $26 00

THE FOOD WE EAT.

DR. JAS. J. PIPER. Turtle Lake, at BENZIE COUNTY Institute, Inland.

In all time the food we eat has played an important part in man's history. To classify its variety would be as impossible as to know every thought it has been instrumental in conceiving. More than that, did the eaters of the world judiciously select the food adapted for their support that are beneficially indicated, facilitating with ease through nature's mechanism the increased mental flow that expands and harmonizes every thought, every act of the consumer?

The food we eat in no little way is possibly responsible for the majority of crimes. From a mouthful of food injudiciously selected we can have results appalling.

Tune the fertile thinker with his mental dish and you have a paragraph that sparkles with gems. Sooth the ingenious inventor by sustaining his mental exhaustion and you have a new creation. Give to the man of muscle that pabulum so deservingly exhibited in his every emergency, then you have the physical sustained. And as far as I know these laws can be justly attributed to the animal creation.

Who will rob his neighbor for the sake of accumulating adipose tissue by indulgences forced upon the consumer, changes his every aspect and unfits him for life's duties, The food we eat shows the nationality, the change of thoughts, and gives to the world in red lines a pedigree.

The food of Europe tells its tale. That nation of people who feed upon congenial food write high on the cliff of fame.

Scan the American table, mark her boundless leaps, listen to her every vibration; her food supply is bountiful and inexhaustible, her people are prolific in their gifts. From east to west, from north to south, from circumference to center, do we send and receive, exchange and buy, articles of food so sustaining to the American. And, by the way, to whom shall praise be given like unto the American chemist for the scientific manner in which foods are today prepared?

THE FARMER'S INTEREST IN LEGISLATION.

REV. L. G. HERBERT, Watervliet, at BERRIEN COUNTY Institute, Berrien Springs.

He is as much interested in legislation as, indeed, more interested in it than, any other class of men, both as related to himself and also to general humanity. The farmer is the main shaft in the wheel of progress. If he fails, then we all suffer. If he be handicapped in the development of his energies or the soil, the consequences are in that proportion disastrous to the whole race. We may survive the conquences of almost any other forms of the trust mania, but if the farmers should organize a trust we would all be absolutely at their mercy.

The farmer has been treated with a great deal of gushing sentimentality on the part of sleek politicians, and at the same time he has had to be contented with what he could get in the way of legislation at the hands of the legislature. He has no power to fix prices for his produce, or to make prices for what he must purchase. He sees the stock industry in the hands of those who know not how to milk a cow or feed a hog or shear a sheep. Under the combinations of capital he sees himself compelled to raise his produce in competition with those who have millions of acres of cheap but rich grazing grounds and grain farms, teeming with millions of live stock, fed and marketed at the price of cheap labor. The small farmer has a gloomy outlook before him. All economic favors are the results of legislation. All discriminations are the children of either unjust legislation or dishonest men, many of whom have for years been successfully plying their trade without righteous rebuke. The sessions of our legislature are beset with trained lobbyists looking after the interests of the capitalists, often regardless of the toiler.

WE MUST FIGHT FIRE WITH FIRE.

There must be organization among the farmers. They must get together. There must be an educated yeomanry. There must be intelligent outlook and intelligent action. Ignorance is the mother of oppression, and we are to be blamed if we allow our rights to be usurped by the godless. Send your boys and girls to your State Agricultural College, where they may not only be trained in the science of farming, but also in the principles of government and political economy, and when the time is ripe for a new order of things they will be ready for the work of true empire building. Many prophecy revolution. There is need of education on the part of the laborers, and then all talk of revolution will be as fog, to be cleared away by the intelligent and thus powerful laboring classes.

Watch your representatives. Write to them. Speak to them. Tell them what you want. There is nothing that ever promised more success than the grange movement. Keep it moving. Revive it. Get together. Lay aside petty jealousies. Read the papers. Get hold of good books. Raise your children in the atmosphere of knowledge. Support your State Agricultural College. Send the boys there to school at least three months during the winter. Send the girls there to keep the boys out of mischief. Educate, agitate, stimulate, cogitate, and keep in the front of the procession. We all know how to talk, but let us get together and crystallize our talking into intelligent action.

FARM FENCING.

WALLACE E. WRIGHT, Coldwater, at BRANCH COUNTY Institute, Quincy.

While the subject of farm fencing is one which, in a country like ours, where timber is becoming scarce, is naturally of interest to us all, I feel my inability to say one thing interesting or instructive on the subject, as my experience is limited. The time is now here when it seems that we must look for something cheaper than rails or lumber for outside or permanent fencing. There are many kinds of

WOVEN WIRE FENCING

which can be built for from 40 to 50 cents per rod, which when well built are very satisfactory; this does not include the posts. I have recently built some of the Lamb wire fence, 11 wires, which seems to be a very strong fence. I set posts one rod apart and would not advise setting more than twenty feet apart at the

farthest. The secret of success in building any kind of wire fence is to be sure that you have good anchor posts. For inside fencing a very good fence can be built from the old rails by staking across the corners lengthwise. We sometimes use one barbed wire drawn lengthwise of the above fence, being careful to draw the wire near enough the inside corners to prevent stock from getting between the fence and the wire; have never had an accident when used in this way, but believe it to be unfit for fencing when used alone. We have tried using the

SURPLUS STONE FOR FENCING,

built 65 rods east and west at a cost of one dollar per rod after the stone were drawn to place. For a few years it was fairly satisfactory and looked very tidy and nice. But the action of the frost, the sun thawing on the south side first, drew it out of line, and now it has fallen in places and makes a very pleasant pastime for my lambs to pass from one field to the other, and is very unsatisfactory as a fence.

Fence building is quite expensive at best where we do a mixed farming, as most of us do in southern Michigan. It seems imperative that we have road fences for our own convenience, although the law does not require them. The conclusion arrived at in my limited experience is that it is cheaper and more satisfactory to build some kind of post and wire fence for permanent fencing, using our old fencing material for inside or movable fences. The most expensive and decidedly the most unsatisfactory kind of fencing I have had any experience with is political farm fencing. A cyclone is sure to strike one side or the other.

THE COST OF KEEPING A DAIRY COW.

GEO. H. REDFIELD, Sailor, at CASS COUNTY Institute, Edwardsburg.

The following are the figures for 1898 in a dairy of twelve cows:

12 cows, average of 325 days per cow. 1898.

Dr.

To 200 bu. at 25c	$50 00
165 bu. corn	50 00
6 tons beans	22 00
1,500 lbs. middlings	11 00
pasturage at $10 per cow	120 00
200 days labor	200 00
interest on value, $600 at 8 per cent	48 00
Taxes	3 00
	$504 00

Cr.

By 2,835 lbs. butter at 20c	$567 00
4,800 lbs skim and buttermilk	48 00
12 calves at 10c	75 00
	$690 00
Profit	186 00

The Babcock showed 3,052 pounds of butter, but I only recovered the amount given above, which includes cream for house use, with which we keep an account. I might have fed higher and produced more butter, but would it have been profitable? This account shows a clean profit of $15.50 per cow. No account was kept of the coarse feed nor of the manure. I believe one offsets the other.

MOTHERHOOD.

MRS. A. W. STALKER, Sault Ste. Marie, at WOMEN'S SECTION CHIPPEWA COUNTY Institute, Sault Ste. Marie.

The life of a farmer's wife is so full of toil that she is in danger of losing sight of those higher duties and privileges which belong to motherhood. There is no

estate in life more sacred, more holy, than that of a mother. God, as it were, calls her to become a partner with himself in his great creative work. Coleridge says: "A mother is the holiest being alive." The bearing and training of children is womans peculiar and God-given prerogative. It demands her sublimest faith, her deepest thought, her noblest heroism. Her responsibility for and influence upon her child begins not with its birth, but when the little life is a part of her own. Her thoughts and moods stamp upon the little soul a disposition vast toward good or evil. The mother of Nero was a murderess; the mother of Washington a pious, gentle woman. Before the birth of Frances Willard her mother lived a life of thought and prayer, keeping her mind occupied with noble themes. So was born she who poured forth her great store of womanly love and skill for the healing of the disease of evil of the world.

A child is born. Wondering eyes are opened for the first time upon a new world whose sunlight is the mother's smile. Another little barque is launched upon the sea of life. What does it mean?

"Mother, to thee this day is given
A soul to keep and fit for heaven."

When we look upon a child as an immortal being whose eternal destiny is decided by what it is here there hovers over it a thought so vast, so far reaching that we are well nigh overwelmed at the idea of the responsibility of motherhood. We are almost saddened as we look into the sunny face.

"A solemn thing it is to me
To look upon a child that sleeps,
Wearing in its spirit deeps
The undeveloped mystery
Of our Adam's taint and woe
Which when they developed be
Will not let it slumber so."

The words of Christ ring in our ears. "Of such is the kingdom of heaven." And, "Whoso shall cause one of these little ones to stumble, it were better for that man that he had not been born." When we touch child nature we are upon holy ground.

The mother is the child's first and most important teacher. Under her influence intellect is first awakened, heart opened, habits formed and character molded. She to a large extent creates the moral atmosphere that surrounds the young life.

She is his first religious teacher, when folding the tiny hands she repeats the beautiful words: "Our Father." From her love and care he learns of the great tenderness of the Father heart above. Loving and obeying the earthly parent he is led naturally to love and obey the heavenly.

To her also is it given to teach the child

TEMPERANCE, SELF-CONTROL IN ITS BROADEST SENSE,

control of the appetite, temper, tongue, mind and will. We might call it a lesson in the gaining of victory. With many defeat becomes a daily occurrence. The lessons in school are difficult and the child gives up without mastering them. The practice of exercises upon the piano becomes tiresome and the little girl allows herself to be defeated. It requires will power to conquer an evil temper and the boy gives up the struggle. Thus is formed this debilitating and fatal habit with which life can never be a success. On the other hand, with the habit of conquering, life becomes one grand victory. The fiercer the battles that test the soul, thrusting it back from its purpose, the stronger are knit and strengthened the sinews that can move the world. The Indians say that when a man slays a foe the strength of the slain passes into the victorious arm. This weird fancy contains a truth.

A mother should also teach her children the nobility of labor, that indolence is to be despised in rich and poor. Usefulness in the home is one of the best means of developing character, fitting it for larger usefulness in the world. Children are naturally active; if we do not give them something to do, Satan will. Idleness is the secret of much wrong doing in children.

Whether Christian or not, give to the child the Bible, for it is the law by which he is to govern his life. Children readily apply its truths to practical life. It is of literary as well as of ethical value. Ruskin says he owes all of literary merit his writings may possess to the Psalms and passages of Scripture learned at his mother's knee.

Finally, we must teach our children the beauty of uprightness, of holiness, by

our own lives. No influence is so strong as that of example. The reason we have striven after a certain noble quality is because we have seen it grandly and sweetly exemplified in the life of another. We could no longer live as before, for we had caught a glimpse of something higher and nobler.

Finally, there is no holier realm of action than the home, where children are being trained not only for time, but also for eternity. There is no work that yields such large returns in future years as that of a devoted Christian mother. How rich every day is our reward in love. Let us love this work and not look upon it as a burden and a sacrifice. A few short years and our birdlings will have flown from the home nest. Lessons will have been learned never to be unlearned. Let us make the most of our opportunity, and in our weariness not lose sight of a privilege that angels might envy.

BEGINNING REFORMS AT HOME.

MRS. L. CARUS FAUBEL, St. Johns, at WOMEN'S SECTION, CLINTON COUNTY Institute, St. Johns.

Look with me to the successes and failures of the past. Is the balance in favor of progress or retrogression? We see an activity everywhere. Who leads? What motive has grown out of past effort? What is the aim and promise of the future? We must organize, work in harmony, and proceed with care from known to unknown, using all accepted and tried means of profit that promise progress if we are to attain to the desire and possibility of the twentieth century.

It is scarcely fifty years since our emancipation to a plane above a chattel; since a higher education was attempted amid protest and insult; since our entrance into fields of professions was ridiculed and condemned; since slavery was a part of national law and the expedient of the ballot to the slave made free suggestion of universal suffrage to right all wrongs.

I may not dwell to speak singly of the many noble women whose names are legion and whose lives were labors of love. Suffice it to say, their example and effort made it possible to enter college, to gain diploma and degree. We have proven capable of mental skill in whatever we propose. It is in woman's physical mechanism alone that all the argument lies against her as a worker in public life. She must use her strength with more economy. The condition of prospective motherhood often unfits her for serving the public in a public way. Again, when men are in full strength in life, women for a time need rest and quiet. Our aim and system must be in harmony with nature's intentions.

THE HOME THE CENTER.

That I may be clear and you understand at the outset my plans, I assume that the homes that dot our fair land are the centers from which all reforms begin; from which all good proceeds. I shall set aside all arguments of the past as regards executive skill, capability or not; all antagonism that may have arisen with men through jealousy in competition as wage-earners, or through fear of losing our companionship, or from whatever cause, and I shall appeal to the candor and the best manhood and womanhood of our land to listen to me and reason with me. I shall farther assume, in the law of existence, man's intent ultimately is to be a husband; woman's first, highest, and natural choice is to be a wife. Man and woman are each the complement of the other. Our spheres run side by side—the oak and the vine. We need his strength and support—he needs our sympathy and love. He may have been misguided, ungallant, and even unjust—has she ever been perfect? Or can we charge mistakes alone to either? To exercise a supreme power, even justly, is a divine rather than human act. Because of this the need of woman's equal authority and wisdom, that the rights of each be kept in balance. Whatever we aspire to we must seek his welfare—better him—and keep him with us—make him see and feel his need of us—his loss without us—our loss without him. The destiny of one is indissolubly woven with the destiny of the other, and the highest attainment of each secured through the inseparable efforts of the other. Let us then labor as we never have before to better our homes—all homes—to elevate our planes of thought and action.

Now comes the question how? We will agree that our faces and lives reflect the sunshine or the shadow of the home; that the homes of any people are the moral indicators of its purity, strength and promise. Threaten the home and you throttle the nation. Blot out the home and vice runs rampant. Better the home and you better social life and the body politic. Bring the home back to a normal condition and you dispense with club-room, saloon and brothel. But mind, we can never do it alone. The ballot will not aid much yet, if ever. We must have the support of our best and noblest minded men. Create a public sentiment that shall be world-wide, but begin with men and women in full sympathy with each other, and with one end in view. How can a mother raise her child to be an ideal man or woman with a profane and foul-mouthed husband? The creation, education, and maturing of a human being should be above all things pure in contemplation and association. The father should take equal pains and pride with the mother, to keep the child-mind clear. How can we do our best work in the face of so many insults? To note one—walk down street, our faces and forms portrayed in half nude or other coarse forms on wares of liquor and tobacco, and other manufacturers. I am glad in places a crusade has begun and I hope it will be supported by every man who loves virtue and modesty in woman, and prizes her person above lust. Let woman be free to fix her own sphere; let her be able and self-reliant, and enter matrimony from choice, not necessity in any way; let her keep in view the need of an unsullied womanhood. Study how to be better wives and how to encourage men to be better husbands—looking ever forward to improvement of the race by better representations.

SUCCESSFUL FARMING.

J. J. COVENTRY, Frederic, at CRAWFORD COUNTY Institute, Grayling.

But with all the labor we talk about, if it is not husbanded, or the results of it not saved, it really does not meet the ends that a person has in view. A person may be ambitious, energetic, blessed with good health and strength and labor hard while the same lasts, but there is an end to all things.

A successful farmer not only requires a farm, but everything else that belongs to a farm. He needs a good comfortable barn for the preservation of the products of his labor, and the comfort of his stock. The material used in the construction of the same (with perhaps the exception of the timber and lumber) has to be purchased, and it takes wealth to effect the purchase. It is true, wealth is obtained by labor, and it is also true that it is preserved by savings and accumulations, and it is also true it is increased by diligence and perseverance. Some have different ways of saving—some have a barn under construction quite a few years before they make a commencement, but their savings consist in buying shingles, lumber, timbers, nails, hinges, etc., and some even have their carpenters partly paid for the building of the same, before they commence, but when they do commence, they proceed until it is partly finished, and call it their own by its being paid for. It is the same way in building houses.

A great many lay all ills to legislation—such rot is tiresome.

WHAT LEGISLATION CAN MAKE A LAZY MAN INDUSTRIOUS,

or a shiftless man thrifty, or a spend-all saving? How many we meet on street corners or in some stores formulating economics for the betterment of our country. Gold standard is what is wanted: or the salvation of the country lies in the 16 to 1 standard; the public debt can be paid only upon a silver basis—but not a thought given about paying their own debts, nor improving their own social conditions. How many politicians have a panacea for all our ills—they want to be our physicians. Our only hope lies in improving ourselves. If we violate the laws of nature we suffer; if we neglect the duties required of us we suffer. Legislation cannot help us—it all lies in our own individual selves.

When a man glances forward he finds temporal contingencies for which he has to provide. We that are farmers may fail to realize certain expectations upon crops—sickness may come upon upon us—death will come some time. The first two we may escape, but the last is inevitable. Therefore, as I have before remarked, in regard to making a living it is our duty as prudent men to so arrange by im-

proving our farms, adding to our surroundings by our savings in the event of either contingency occurring, the burden shall be lessened to as great an extent as possible not only to ourselves, but also to those who are dependent upon us for their comfort and subsistence.

EXPERIENCE WITH BRONZE TURKEYS.

MRS. ROBT. HUBBARD, Chester, at EATON COUNTY Institute, Olivet.

Experience with Bronze Turkeys was read with the intent of arousing an interest in the breeding of thoroughbred poultry as a profitable industry for women. A few briefs of events that roused in us the desire to become a "crank," how we caught the "Bronze" fever, our first and second exhibitions, buying and selling experiences, etc., were given, but the discussion following was so much more interesting than the paper that we prefer to give a summary of it for your report.

It was demonstrated that turkeys are a profitable fowl to raise, even from the farm-wife's standpoint or just for market, not only giving her pin-money, but often furnishing the means for replenishing the family wardrobe for winter, buying school books, and even paying the inevitable taxes, their sale coming at a time of year when money must be had and the owner of a small farm may have nothing else to sell just then that will bring a reasonable price. The cost of production for small flocks is practically nothing, as they will thrive and grow as insect destroyers. Allowed to roam unmolested through growing crops they will do no damage, and leave no trail except in the undergrowth. The poults scatter about and secure their share of bugs, worms, and flying insects, for it's the baby turkey's nature to hunt, eat, and grow as they go.

When there was a dearth of clover because of the destroying insect, a neighbor who had a special spite against turkeys was the only man to have a crop. He had a splendid yield of seed, and did not know what to lay it to only that a flock of turkeys had been in the field every day. He had jokingly said in the summer he'd be after us for damages, but when fall came he had grace to acknowledge he was in our debt.

The statement by a woman that neighbor's turkeys were a nuisance was met by the man appealed to for corroboration, by the reply that it was all owing to the state of mind, a reply containing "multum in parvo."

In caring for and feeding, the closer we follow nature the nearer we attain perfection of development, but there are many things to be considered. Their wandering propensities can be lessened by regular and judicious "tolls," lay of land, soil, water and many other items essential to success. None of our poults are with turkey mothers; we do not house at night or during storms. Have had them come through several days' rain bright and pert as robins.

It costs no more to raise a thoroughbred than a mongrel. We have no trouble to dispose of all the big birds we can spare on the market. Yes, it costs money and time, and one must have a love for and a never flagging interest in her birds to become a breeder worthy of recognition by the fraternity, but that time come, by honest means, success is almost sure. The knowledge gained of business, birds, and people has broadened and expanded our life and we feel that we have been blessed in a greater than merely a financial sense.

THE CULTURE OF HOED CROPS.

LEONARD BROWN, Clio, at GENESEE COUNTY Institute, Clio.

My reason for taking this subject is not that there has not been enough written on it by our best agricultural writers, but that the farmer as a rule, is so hard to convince that there is a better way than the one their fathers practiced. That there is a great loss sustainied by the farmers in the usual mode of cultivating hoed crops, I will endeavor to show, and give the remedy. In talking with farmers on this subject, I am met with the remark that "We get a good crop our way." My answer is: Yes, but you could get a better crop with less labor; and it is the extra fifteen or twenty bushels that often makes the difference between loss and profit.

THE ROOTS OF CORN AND POTATOES.

Nature has provided plants with a system of roots for their support and development, and if these roots are disturbed or destroyed the plant must suffer in consequence, thereby decreasing its productiveness. I traced the roots of a young plant of corn, the longest leaf of which was twenty-four inches, and found the main root thirty-two inches long. The roots started from the plant one and one-half inches below the surface, and undulated through the soil two, three, four, and at no place more than five inches below the surface. I found the roots of a plant of potatoes eight inches high to be twenty-four inches long, penetrating about the same depth as the corn roots. Beans have a root system quite similar to corn and potatoes.

You see by this that if the cultivator runs more than two inches deep it will sever the roots and weaken the plant. Potatoes not only have to contend with the teeth of the cultivator, but when large enough, have to be tortured by the cruel shovel plow, breaking their roots, and making a drain on each side of the row to let the sun and air dry them out and lessen the crop.

That there is more in this than appears at first glance, let me show you: The loss per acre by deep cultivation I estimate by my experience and observation, to be, in corn, from twenty to forty bushels of ears per acre, and in potatoes thirty to fifty bushels per acre. The loss to the farmers in my township in the year 1888, taking the lowest estimate, at the average price for the year was $7,353.90. No beans were grown here at that time. But the relative loss is as great as with corn and potatoes.

Having shown the evils of deep culture, I will give my method and tell of implements used. The ordinary five-toothed cultivator, as used by the majority of farmers, is not the proper implement to use, from the fact that it must run too deep in order to do any work, will miss nearly all straight-rooted perennial weeds, and requires to go twice in a row.

THE PROPER METHOD OF CULTIVATION.

Immediately after the corn is planted, go over the field with the weeder. Then as soon as corn is up and leaves opened out, go over again with weeder. Then use harrow and weeder in conjunction with one-horse cultivator, rigged with sweep teeth. A good set for corn is two twelve-inch and one fifteen-inch sweep. This will cut all space between rows three and one-half feet apart, and take every thistle and milk weed before it. Set wheel under frame so that teeth will run one and a half or two inches deep. For potatoes, use harrow twice or more before they come up; then use harrow till it injures the plants; then use weeder and cultivator, rigged as for corn, using smaller sweeps and leave level. For beans use weeder immediately after planting; then as soon as the plants have straightened up and the leaves opened out, use weeder and cultivator, rigged with two six-inch hoes and one eight-inch sweep or some combination of hoes and sweep that will fill space between the rows.

The reasons for cultivating the crops in this way are to destroy weeds, to conserve the moisture by a dust mulch, to save labor, to increase the crop, and preserve the roots—remembering that at no stage of the growth of the plant can you cultivate deep without injuring it.

FARMING ON SANDY SOILS.

E. W. CHASE, Bently, at GLADWIN COUNTY Institute, G'adwin.

By the request of our worthy secretary I consented to again stand before this honorable body as the exponent and advocate of the just merits of what are termed light or sandy soils. And by doing so I labor under a great deal of embarrassment on account of untimely frosts that completely ruined my corn, potatoes, beans and vegetables, in so much that from eight acres of corn, one acre of potatoes, and one acre of beans I did not realize my seed, and for this reason I can make no exhibit.

Up to the night of the 10th of July my crops looked fine and would compare favorably with any in the county, and I justly expected to bring an exhibit at this time that would vindicate my claim, namely, that those soils if properly treated

would become valuable property and make homes for thousands of families.

All the crop I harvested this season was an acre of oats and rye, a patch of watermelons and bagas, all of which were on a par with my neighbors' on clay soils; and when we take into account that my farm is on what is termed jack-pine plains and considered the lowest type of farming land by the public generally, it would seem that the production of fair crops without the use of capital and using only such means as cluster around every farmer, the matter was worthy of note. The rapid growth of my crop in the fore part of the season, notwithstanding that June was very dry and hot, has been a strong confirmation that deep planting is necessary to a crop on these lands.

HOW SETTLE THE LANDS?

Now the great question that confronts us is what can we do with these lands to get them into the hands of those who will develop them and make them a factor in working out the destiny of our county and State. In the township of 18 N., R. 2 E., there are 13,040 acres, all of which except 4,000 acres, have reverted back to the State and are known as State tax lands. The uncertainty and vexation that enshroud a tax title practically debar the public from settling on these lands, but if the State Land Office would act promptly and open these lands to homestead they would settle up rapidly and soon be on the tax roll and be a live member of the county rather than deadbeat.

These lands must be put within the reach of those of little or no means, and it is possible that a little substantial encouragement in a prudent way might work wonders in the development of these dead lands.

The writer has had ten years' experience on what is considered by many a worthless farm, and has come to the conclusion that stock raising, both sheep and cattle, will pay, and rye, wheat, some kinds of oats, turnips and grass will yield paying crops by good workmanlike farming.

WHEAT.

CHAS. A. VANDEVENTER, Ithaca, at GRATIOT COUNTY Institute, Alma.

Of all the cereals, there is none raised so extensively in all parts of the civilized world as wheat. The mention of wheat in the Old Testament and its culture by the ancient Egyptians are proofs of its antiquity, and Chinese history declares that it was introduced into China about 2700 B. C.

Like other cereals, wheat is not certainly known in the wild state, and its origin has been the subject of much speculation. Some suppose it to be a plant now extinct in the wild state, others that it is the cultivated form of what are now regarded as distinct wild species.

The limit to the successful cultivation of wheat is not determined so much by the cold of winter as by the temperature of summer.

Wheat is largely cultivated in most European countries; some of these a few years ago were exporters, but do not now raise enough for their own consumption. In the United States, wheat growing has rapidly extended westward. In some of the older states an improvident course of agriculture exhausted the land until remunerative crops could no longer be raised. Through the lack of a system of rotation the soil became stocked with the seeds of weeds and the increase of destructive insects added to the difficulties which made it necessary to seek new land. But where better farming prevailed, the crop is still profitably grown. The new prairie soil of the western states allows the crop to be raised without the expense of fertilizer, to which the eastern farmer is subject, though this is in great measure offset by transporting western wheat to market.

Nothing in the history of agriculture is more striking than the remarkable increase of wheat growing. On the Pacific coast, especially in California, where the crop in 1850 was only 17,200 bushels, while in 1873 it was over 21,504,000 bushels, both soil and climate are most favorable to its culture. The climate is so rainless in summer that bags of grain may be stacked up in the open field for weeks without fear of injury.

DECREASE OF YIELD.

The history of most of the wheat growing portions of this country shows a regular decrease in yield; counties in the State of New York in which the average yield at the beginning of this century was 20 to 30 bushels to the acre, now return 5 to 7 bushels. In the fertile soil of Ohio the average diminished in 50 years from 26 bushels to half that amount. That this decrease is due to the lack of a proper system of agriculture is shown by the fact that in England, where the land has been under cultivation for centuries, the average yield is 36 bushels to the acre.

Brother farmers, in view of all these facts, is it not time that we were up and doing? Who is to blame for the decrease in yield if it is not the tiller of the soil? Some may say change seed. New varieties are frequently offered as superior to all others; but every good farmer knows that the more productive the wheat the better must be the soil. There are many varieties, one French experimenter having cultivated 322. Why not raise our land to that high state of cultivation where we will not have to change seed? What shall we do when the large wheat fields of the west give out? Where will our supply come from if it does not come from the increase in yield?

May we live to see the day when we can raise 40 to 50 bushels per acre and receive one dollar per bushel, and then we may feel well paid.

THE ROMANCE IN FARM LIFE.

MRS. ADDIE BISHOP, Hillsdale, at HILLSDALE COUNTY Institute, Hillsdale.

As the romancer sets out with hard facts of history and embellishes and glorifies them with fanciful occurrences till we have a vivid picture of what might have been from those facts, so I would set out with the hard facts of farm life and embellish and glorify them with some of the practical might-be's of existence till the most of our rural homes would be quite different, and country life would be coveted.

It is too bad that we so often forget the natural advantages of the country—forget to be cheered by the song of bird, the beauty of the blossom, the comfort of the trees, the glory of the landscape—forget to keep young in the romance of existence—forget that through these things God speaks to the softened heart—speaks often words of infinite comfort and cheer.

It is too bad that the farmer esteems these things so little; forbidding his imagination to soar above "how many bushels to the acre," and "how much per pound."

How beautifully the poet Whittier has expressed this need in rural life:

"'Twere well, thought I, if often
To rugged farm-life came the gift
To harmonize and soften;—
If more and more we found the troth
Of fact and fancy plighted,
And culture's charm and labor's strength
In rural homes united."

How can we become so thoughtless, so warped in judgment, so lacking in patriotism, as to let our higher selves degenerate in the struggle to get the most dollar bills out of life? I would not say a word against the dollar bill. It is very useful in its place. But if to store these away we must smother the sentiment of life, what do we gain? This:

"Shrill, querrulous women, sour and sullen men,
Untidy, loveless, old before their time,
With scarce a human interest, save their own
Monotonous round of small economies
Or the poor scandal of the neighborhood."

Remember that a man is more precious than the gold of Ophir.

I would not be thought to say or think that all farm life has taken on all these dark hues, but we can but think that a pall, sometimes of these colors, sometimes shading to lighter, has settled over nearly our whole rural population. We see it in the weak complainings, the lack of interest, the general feeling of self depreciation.

That there is plenty of work in farm life we all know. That it is the wholesome hard fact around which to weave the romance of noble living is quite as true.

And if we in our thoughtlessness have stripped it of its comely draperies till it stands hard and bare before us, repelling, yet holding and molding us into graceless unloving people, whose fault is it? Surely our own.

Let us learn from the beatitudes of nature the gentle courtesy to "our own"—learn the miracle of love, the giving that is gaining.

There is suggested the forming of country clubs and lecture courses which have been successfully tried near by. Also a county club for the women of the city and country. And remember, this must come largely through our Marys and Marthas—the love and grace of Mary, the service of Martha.

BUTTER-MAKING ON THE FARM.

A. J. McCUTCHEON, Ransom, at HILLSDALE COUNTY Institute, Hillsdale.

The subject is as important as any which is apt to come before an Institute, because all farmers make butter. But few do, while all could, make that which is good, particularly in the winter. What is required is not so much an expensive apparatus as a knowledge of a few foundation principles. Not one farmer in one hundred has a dairy thermometer. I commenced keeping cows because I believed they paid better for care and feed than any other stock; and after six years' experience have no occasion to change my mind; partly, perhaps, because I was a poor hand to buy and sell, did not like to dicker, as I had to more or less before I kept cows. The cows give me a certain, steady source of income. Also because I had children who could help me milk, making me independent of outside help if necessary.

It is best to raise your own cows. It is hard work to get a man to sell his best cow, or even a good one. I keep the Jerseys because concensus of opinion seemed to be that with them you receive more money for food and labor than with any other breed.

Feed early cut hay, corn meal one part to two of bran. Would emphasize the value of oat and pea hay, both for summer and winter feed. Plant corn for fodder, using 10 or 12 quarts of seed per acre. Have taught cows to eat skimmed milk so as to be ready for hog cholera.

Set milk in "shotgun" cans set in a cold place in winter and submerge in tank supplied with water from a fountain in summer. Have tested milk a number of times and the loss of butter fat did not seem to be great enough to justify the purchase of a separator for the number of cows kept, which was 16 the past summer. Shall increase the number of cows, then I think it will be for my interest to have a separator.

I churn with a horse as soon as cream is sour. Most farmers' wives let their cream get too sour. They keep their milk in too warm a place; this is the principal cause of the poor dairy butter. I ship my butter to Toledo. Average price per pound the past year, 18c; gross receipts per cow, $45. Seven were heifers with first calves. Cows run loose in barn basement, which I keep well littered. They keep as clean as in summer, and there they can have free access to water, which is supplied from an elevated steel tank in milk house. The latter is of stone and has a fire twice a day or oftener in the winter, which keeps water warm.

THE FARMERS AND THEIR PUBLIC DUTIES.

C. S. NIMS, Sand Beach, at HURON COUNTY Institute, Sand Beach.

I should say that a farmer's, as well as every other man's public duties begin right at home and with his own self. I think he ought to be a good man and just as much of a man as he can be in every respect. If he is this he will have the best farm and the best surroundings he can.

Next, his public duties are to the roads in his neighborhood. He should not only cheerfully pay his highway tax, but should do his utmost to maintain and improve the roads in his district, and not shirk when called upon to hold official positions.

Then, as education is one of the principal pillars of the republic, he must seek to promote the means in his own school district. He must be liberal in voting the

money for its support, and active and wise in seeing to its expenditure. He must have a pleasant and attractive school house and yard, suitable apparatus and books, etc., and a competent person in charge of all to see to the proper enforcement of discipline and the moral and intellectual interests of the school. The work of the teacher should be reinforced by the support and encouragement of the parents and school officers.

Then he has his duties toward his township, which he should attend to faithfully and conscientiously, and if he should be called upon to hold any official position he should be ready and willing to attend to it, even if it should involve some sacrifice on his part. Usually public offices, especially if there is any considerable remuneration accompanying them, do not go begging; but there are those which have little honor and small compensation that are quite important to the public welfare, and should be filled with the men who will do the best for the public.

The same is true of all the various political offices—national, state and county.

To this end, a farmer should be a wide thoughtful reader, not only of farming topics but of current events, history, politics, religion, education, and philosophy. He should read much and think much.

With most of us the time has passed for getting what is called an education. We are too old to begin to learn many things of a fundamental character. We can, however, make up very much by a wise use of our time in the little that remains to us.

CO-OPERATION AMONG FARMERS.

HENRY L. DRAKE, Tawas City, at IOSCO COUNTY Institute, Tawas City.

Although farmers and those depending upon them form nearly one-half of the whole population, there is not any class who have less to say in immediate legislation; less power to demand equality or less influence in shaping the destiny of the State.

In this State, as well as others, corporations and trusts do not stand still. They are aggressive. They seek to control representation, influence and power in State councils, in order to secure advantages over others. They are not producers of wealth, but gather their fruits from others' toil.

These things should not be. How can we prevent them? When corporations desire a good thing for themselves they co-operate. We should learn to do the same. They work together for greed and self. We should take a higher plane. Their co-operation cannot be lasting; ours should be.

In considering co-operation, we have three plans, with their illustrations: First, co-operation under the control of a department or chief, guided by law, as illustrated by our postoffice system. Think how millions of people are cheaply and justly served by it. Are you willing to go back to the old plan of private delivery of letters, papers, and small parcels? Why cannot our produce be collected and delivered to consumers under a similar system? Second, In our common schools we have an illustration of co-operation under law, administered by department and combined with "mutuality," as shown in the various powers given or retained by school districts. Are you ready to go back to the old system of parental and private teaching? Why should we not have a similar system under which our children could learn a trade or farming? Third, In the Grange we have co-operation under "mutuality" only; and of those who have tested the benefits of such an association, I will ask, are you ready to disband?

From these illustrations we can see that true co-operation is of slow growth. It must be learned by study, trial and experience, like any other branch of farming. There are two basic principles under true co-operation, which, if properly heeded, will help us on our way:

THE FATHERHOOD OF GOD AND THE BROTHERHOOD OF MAN.

Having these in mind, we will turn away from all plans which have self only in view. Time will not allow me to mention all the ways in which we can co-operate for mutual good; I will mention a few which have been tried and proved.

We can co-operate in buying and using farm machinery; in buying and dis-

tributing seeds and seed grain; in selecting and killing animals and distributing the meat for family use; in gathering and selling perishable fruits in their season; in raising and feeding animals for export trade; in shipping wool, grain, and other produce to the best markets. In each one and all of these plans there is room for from ten to thirty farmers in every locality. More than that, the benefits will not end in buying and selling. True co-operation will bring a better understanding of our relationship to each other, and to all, and we will become better farmers, better men, and better citizens.

As individuals, we can learn to co-operate; and in this line I will urge you to co-operate with your home merchant, but not by having your name placed on his books as debtor. Remember that the cash buyer can discount your credit 15 per cent and win every time. Pay as you go. If you do so, and have a crop slow of sale, the merchant and his wholesale house in the city can help you to find a market. This has been proved.

Learn to co-operate with the consumer. The consumer pays the best price for what you sell and the highest price is what you want. To get that highest price, you must first learn to give a good article, nicely handled, and faithfully delivered. Such co-operation is a pleasure to the buyer and a profit to you.

SELF-RELIANCE.

MRS P. C. GOLDIE, Tawas City, at WOMEN'S SECTION, IOSCO COUNTY Institute, Tawas City.

This is a characteristic that at one time was thought to be the sole prerogative of man. And a womanly woman was the one dependent upon the opposite sex for subsistence, counsel and support.

There has been a long and progressive stride in the self-reliance of women. No longer do they cling like the ivy, fastening their tender though harrassing tendrils upon the affections and aspirations of men, but growing together as God intended them to do, man and woman become the nucleus from which the most beautiful life of earth springs up everywhere over this fair land of ours.

One is sometimes tempted to deplore the absence of the good old days of chivalry, when knights were so plentiful, and Dulcineas were waiting to be liberated by some Don Quixote, but the very self-reliance of women has made this unnecessary.

One can see no particular virtue in a woman having to wait on the pleasure or caprice of the male sex for the doing of almost anything about the home. Indeed, we have known women who claimed to be able to put up stoves, shake carpets, harness a horse, and the thousand and one other things if need be that have heretofore been considered only work for men. I do not say that women yearn to do these things, but if necessity arises, the self-reliant woman does not hesitate to do her best under all circumstances.

TO BE SELF-RELIANT IS TO BE SELF-RESPECTING

for with every difficulty overcome, there comes with it a sort of exultation that sends the healthy blood buoyantly through our bodies, so that we feel a disregard for whatever impediment lies before us, and with confidence take hold of the next duty with courage and zeal, knowing that we can do whatever God places before us.

We have only to look about us to see how many self-reliant women there are. Widows with little families dependent upon them, who are bravely fighting the battle of life for themselves and their dear ones; delicate women they are, too, many of them, but with brave hearts and strong minds they do their best, and by their self-reliance surely deserve the respect of every citizen and the love and lasting devotion of their children.

The woman who is not a widow, but either on account of the sickness, laziness, or infidelity of the husband and father has the position of wage-earner forced upon her, deserves our commiseration and respect also. If the husband is sick and unable to do his part, we know how the true and loving wife will be glad to bravely put her shoulder to the wheel, and with busy hands and loving heart she keeps a cheerful face, so the sick one may feel neither care nor want. If the husband is shiftless and lazy, God pity her! No loving thoughts move her then, but plodding

wearily along with her thrice-heavy load, she does her duty as before, not, perhaps, so lovingly and sweetly, but with a dogged determination, that persistently does what is placed before her, and much comfort and restfulness are experienced, even under these circumstances, if the children see the situation and take hold of it as they should—never forgetting how a loving word or a tender good-night kiss will relieve the tension and weariness of the dear mother whose first, last and only thought is for them and their future. It is a disgrace and shame when we look upon the list of those receiving aid from this county's finances—when we see the number of able-bodied men and women who are not ashamed to ask for public aid, while we have only to look within a stone's throw of this building to see delicate women who have schemed and planned night and day, year after year, unaided and alone, and never asked nor received a dollar from the public treasury to assist them in their struggle, but have raised their children from babyhood to manhood and womanhood and still plod on. Thank God, there is a reckoning day coming and surely there will be a long line of noble, self-reliant, self-sacrificing women who will hear the gentle benediction of the all-seeing God—Well done! good and faithful servant, enter thou into the joy of thy Lord. She hath done what she could!

GOOD ROADS.

F. G. CLARK, Iron River, at IRON COUNTY Institute, Iron River.

It is a platitude to say that the roads are bad. Everyone concedes the fact, and at once concludes to accept the inevitable. As the obstruction to commerce is general, and affects all classes, all seem content with the situation. Nothing is done, probably because of the current belief that improved roads entail an expenditure of too much capital, and so the roads of our townships, as also those which are under the direct supervision of our county officials, are maintained in a semi-improved state. In the case of township roads, the construction is almost invariably left in the hands of parties elected, not because of any especial qualifications, or technical knowledge, but for their genial, or liberal disposition, or their ability to control the suffrages of their followers. The administration is in like manner controlled by official boards who are chosen because of their integrity and general ability in every occupation other than engineering. Of all things in the domain of common property, the public road is the most used and the most conspicuous. It is the most notable index of civilization and of progression.

There is positively

BUT ONE SOLUTION OF THE ROAD PROBLEM.

Competent executive ability must have control of road improvements, and that must not be hampered by unwise local legislation. Except in very few instances, the entire road system of Iron county has been one of malformation from its beginning. The material used has been principally the subsoil most convenient to the builder, irrespective of the fact that it is composed of decayed vegetation, and lacks the qualities most essential to the maintenance of a good road-bed. Another and equally deplorable feature is the contour of road-beds under the present system and management. The road centres are, almost invariably, below the margins which form their connection with the ditches, thereby preventing the flow of water from roads to ditches—leaving the road-beds almost impassable during the wet seasons, while the ditches are correspondingly dry.

Along and within the limits of the county road between Iron River and Crystal Falls, there exists a

SUFFICIENT QUANTITY OF MATERIAL,

which if properly reduced would furnish a most desirable road-bed. I refer to the rock material. If the authorities who have the matter within their control, would purchase a rock crusher, it could be moved from point to point along the highway and the vast amount of rock material could be reduced to a road dressing which, when properly applied, would have an effect almost phenomenal.

The annual expenditures of funds for road repairs would be so reduced that the

amount appropriated for the improvement would, in a brief period, revert to the people, through a lessening of taxation for road purposes, and a betterment in the condition of their stock, as well as a saving in the wear of vehicles. This method has been tested in localities where the rock material was hauled an average distance of nearly one mile, and found to be most satisfactory.

The expenditure of moderate sums for road purposes, annually, without establishing any permanent results, is in no wise an economic proceeding; while on the contrary, where the raw material best adapted to the needed improvement is already on the ground, it would appear that a refusal to utilize it might reasonably be construed as a direct antagonism to the interests of the commonwealth. It is not my intention to unjustly criticise what has already been done by those in authority. But I contend that it is not only a right, but a duty, which every citizen owes to the commonwealth in which he resides, to do everything within his power to add to the prosperity of that commonwealth—which depends as much upon the condition of its avenues of commerce, as upon any other improvement within its boundaries.

AMERICAN WOMANHOOD.

MRS. N. H. BLEAZBY, Kalkaska, at KALKASKA COUNTY Institute, Kalkaska.

Americans are very proud of their women, and of their handsome treatment of them. Proud of their ability and acheivements, and of the advances they have made over the women of other nations—proud of the fact that they may travel alone anywhere in their own country without fear of insult; proud that every European traveler reports the United States to be the paradise of women.

American manhood has been very just to the American woman; who, when she asked for rights did not reply:

"Ye have my glory,
And wrap round them His ample purple, and bind them in an embrace that seems identity.

The American would be seriously lacking in gratitude if he were not generous to his countrywomen, for women have trained our statesmen and presidents. Look at their histories and see how large a proportion were widows' sons, dependent on that mothers alone for that home-education and character-building which made them what they were.

America is remarkable not only for its good mothers, but for its mother-hearted women—like Frances Willard—whose great hearts reach out to the enemies of childhood and home—and seek to destroy them. These women recognize the home as more essential than either church or state, and call attention to the fact that whatever assails the home threatens the nation's life at its source.

The American woman has gone to all countries, carrying with her the American idea—that true worth is only inherent in the man, not in accident of birth, or in wealth or position—so the American Duchess of Marlborough can dance with the Prince of Wales without any feeling of inferiority, though the Duke, her husband, turns pale and trembles in the presence of royalty.

An American woman is aunt by marriage to the German Empress. An American woman in India occupies a position second only to the Empress of India and Queen of England. A prominent foreign paper says: "The American women are always victorious over their foreign rivals."

It is woman's privilege to be a reformer, and a purifier. It has been said of her that she does not know her powers. Like the beasts of the field, she would overcome the world if she did. This is true—she is in peril of spending her life in frivolity and aims unworthy of herself.

Women have a right to their individuality; they have a right to their own names (whether married or single) and to give their sur-names to at least some of their children, as the daughters of Greeley, Lowell and Jefferson Davis have done, without adding the sur-names of their husbands.

The increased activity of woman in club life and public affairs will not make her a poorer mother, as facts and instances prove, but the time is not far off when results of her part in politics, her new-born interest, will bear fruit in purer manhood and better laws.

WOMAN IN THE HOME.

MRS. F. D. SAUNDERS, Edgerton, at WOMEN'S SECTION, KENT COUNTY Institute, Rockford.

I believe that the crowning glory of a woman's life is in her home; that there she should be her best not only when the guest is present, not as has been said:

"We have pleasant words for the stranger,
A smile for the some-time guest;
But oft for our own the bitter tone,
Though we love our own the best."

Woman as a true helper will always be her best, whether in the home or before the public, and in this humanitarian age, when so many men and women are giving their best thoughts to the elevation of humanity; when new methods are being devised and the needs of humanity better understood, can we relegate woman to the home alone? Can custom longer say, "Thus far shalt thou come and no farther, and here shall thy influence be staid."

Many noble men give testimony to their mothers' influence making them what they are. Would that influence have been the less if others outside the family circle had received light and strength from it? I believe the wife and mother should be a source of knowledge, peace and forbearance in the home, one that has faith in, hope for, and charity toward all the family.

Would contact with the world take away any of these attributes? I think not; it would only broaden her thought, quicken her perception and bring her into a closer and truer sympathy and mutual helpfulness with others.

It is not enough that a few mothers shall convene together in a "Mothers' Congress" once a year and get new enthusiasm in their work. There are scores, yes hundreds, of mothers who should be aroused, stimulated, taught, for it is true the mothers teach the children—but who shall teach the mothers? These mothers' meetings will answer this question. Here a new interest will be awakened, a course of study outlined, ideas given to be put into actual practice in the work of child training. We are learning of the needs of parents; we are reaching out for more effectual ways to meet those needs.

As woman has progressed from obscurity, and the world has learned she is none the less womanly, she finds a need of greater social purity. Where shall we begin to improve upon this condition of society—with the young or the middle-aged class? When we speak of purity we naturally look to a child to possess it, but are the parents of today giving to their offspring a purity that will outgrow the conditions of today?

There was a time when the popular idea was, to keep the young pure was by keeping them in ignorance of evil, but today we recognize knowledge as the best safe-guard of inexperienced youth. This recognition proves that the old error of silence and false shame has had its day; that we have learned the lesson that ignorance is not innocence.

To instruct the youth as to the consequences of social impurity is the real safeguard upon which purity bases its hope for the future health and morality of the people. In the past not a book or paper raised its voice in the interest of social purity, no knowledge for the enlightenment of the young to show them the error of their way, to show them the disastrous results of solitary and social vice. Even the mothers under a sense of delicacy or modesty refrained from imparting to their sons and daughters the right knowledge for self protection. Unfortunate indeed is the boy or girl who must meet sin in its stronghold unprotected by knowledge, and pushed on by inherited tendencies of generations of wrong living.

So I plead for the women to attend more mothers' clubs, more institutes. It will fit you for a better appreciation of the responsibilities of motherhood.

"For a partnership with God is motherhood.
What strength, what purity, what wisdom should belong to her
Who helps God fashion an immortal soul.

WHAT HAVE WE GAINED FROM THE INSTITUTES?

F. E. ODELL, Lapeer, at LAPEER COUNTY Institute, Lapeer.

What we have gained must necessarily be classed under more than one head; first, the financial, and second, the social or moral. Farming has become one of the sciences, and the students of this science by their close application and tests of the truths or falsities of new methods, have given us the results, and we, as tillers of the soil, can do no wiser thing than to meet these wintry days and discuss the practicability of them; to sift out the good from the worthless; to compare our own experiences; to give results of new methods, and, in short, to help one another by advice pertaining to either the production of sale of the products of our farms. The knowledge gained by meeting at these Institutes producers who are making a specialty of some particular line of farming, and who are able to give the exact cost of the production of a bushel of grain or fruit, a pound of wool, beef or pork, and that at the least expense, should be and is a valuable lesson for us who are making mixed husbandry our line of business.

Farmers' Institutes have shown us it is not necessary to plant in the moon; that wheat does not turn to chess; that fungus diseases must be properly treated by fungicides; that troublesome insects are to be subdued by insecticides; that there is a balanced ration for the fatting steer, another for the milch cow—and to be brief, that all our live stock cannot be fed from the same grain bin to obtain the best results.

If I should ask the question, "What are the farmers in need of most?" I presume I would receive various answers, but let me tell you what I think they need. They ought to be members of a Farmers' Club, a Grange, or a similar organization, held, if in no other place, in the little red schoolhouse on the hill, in the district where they live; where they and their neighbors shall meet on Saturday afternoon of each alternate week—to do what? To learn to raise better wheat and calves? Yes, but best of all, to learn how to grow better boys and girls, who will soon grow into better men and women, to get better acquainted with each other, and to have a season of rest and social enjoyment, which is necessary if we would grow into better men and women, physically and mentally.

All honor to the grand old Grange. It has been the first in the ranks to pave the way for the coming of similar organizations, be it Farmers' Institutes or Farmers' Clubs, their object is one and the same; to help us financially, but also to teach us that life is worth the living, only when the financial is combined with the social and moral. And I trust at the close of this Institute, as we clasp the hands of old and new friends, we will go forth with the feeling that our time has been well spent; that we feel our occupation is one of the best, and if we are not growing richer financially, we are growing richer in those attributes given us by our Maker; that help us to become better men and women.

BETTER BRED CHILDREN.

DR. JULIA P. GREENE, Adrian, at LENAWEE COUNTY Institute, Adrian.

We have a feeling of pride in the asylums and public institutions for the care of the unfortunate children of our State. They mark the growth of the altruistic principle and the higher sentiments of charity. But with this pride comes a feeling of sorrow, almost of shame, when we remember that they exist by reason of our ignorance and crime; ignorance of our high calling in creating human beings, and crime in disobeying God's laws that govern this creative power, and doing our work so poorly, and I believe the individual or organized effort that aims to stop the supply from which these institutions are fed is the highest mark of true charity and humanity.

The birthright of every child is health, strength, and harmony of body and mind. He is entitled to an honorable name, tender care, and wise education; but none of these nor all combined can compensate him for unfortunate heredity, and prenatal conditions that engender disease, or mental or moral deformity.

If men and women used as much common sense in bringing children into the world as they do in breeding stock, we would soon have a better type of human beings. Upon the subject of marriage and parentage, we are blind, deaf, and void of

reason. We follow the impulses of passion without any regard to the law of inheritance, and treat a child in embryo in a manner that would impair or ruin the development of a lower animal, and attribute the results to Providence. The violation of law brings imperfection, the obedience perfection. Providence never caused a child to come into the world deformed in body or mind; never brought sickness to a single human being; never filled a premature grave.

There is no subject upon which we are so densely ignorant as that of the reproductive system, and the laws governing it. To better educate in this direction we need the teaching of physiology and hygiene of the entire body, in separate classes of boys and girls by teachers thoroughly competent to teach this branch. Let the child be taught that at each moment of his existence there is being made upon the living tablet of his body a record that never can be erased. Teach him that, aside from accidents and diseases dependent on common causes over which we as yet have no control, a large proportion of sickness is the result of carelessness, and indulgence in abnormal appetites and passions. Teach him that human life has a money value, and that the man who loses his health in the pursuit of these indulgences, and then demands support from his more provident neighbor is a thief.

I do not disparage the teaching of the natural sciences and the higher classics, but it is surely as important that a young man or woman should know the structure, function and proper management of their own bodies as to be able to unearth a Greek root, or describe the anatomy of a plant or an animal.

We also need purer living on the part of parents and more truthful teaching to their young children on matters pertainingg to sex, instead of allowing them to get wrong impressions from obscene and vicious sources.

The Women's Section of the Farmers' Institute is a good place to discuss these questions, where mothers and teachers may meet and compare notes as to means and methods. I sincerely hope this feature of Institute work may be continued until farmers and farmers' wives will study the breeding and growing of healthy and perfect children with as much interest as they now study the pedigree, breeding and care that is necessary to grow fine colts and calves.

THE PROFITS OF DAIRYING VS. BEEF RAISING.

M. T. COLE, Palmyra, at LENAWEE COUNTY Institute, Adrian.

My experience in dairying covers a period of many years. Sometimes I have ventured a little into beef raising, but not as a regular business. I love dairying because I have learned the business quite thoroughly and know that it is a safe business and quite profitable. For several years we made and sold butter; it being contracted at a fixed price we could estimate very nearly what could be made per cow annually. For eight or ten years we have sold our milk, to be shipped away, on yearly contracts. I like this better than butter making because it saves labor for the family, and one can tell almost to a nicety what the average receipts will be. We get our pay semi-monthly, which is quite an important item; for no matter how hard up one may be there is money in the pocket quite often.

To make dairying pay well the whole business from start to finish must be conducted with the regularity of a clock. I am more fully convinced of this each year. When the weather is regular we can run our dairy of twenty-five cows with a variation of not more than from one to five pounds of milk daily for a succession of days. A very little irregularity in feeding or exposing to the weather or in milking will change the product from twenty to forty pounds. A change in the weather, unless the greatest of care is taken, will produce the same results. Exciting the cows in any manner will produce like results. We very seldom vary five minutes from commencing to milk—at five o'clock, both morning and evening, winter and summer.

Our winter feed is usually cut corn fodder, ensilage, and bran, fed together both morning and night. After milking, a very little clover hay is fed. At noon we allow what clover hay the cows will readily consume. It pays to feed and care well for the cows. Look out that your cows do not go hungry when pasture is short. They must not be compelled to skirmish around all day in warm weather (especially in fly time) to get their living. During these times corn fodder should be fed liberally twice each day, besides a few quarts of ground feed or bran, both morning and night. Very many neglect these matters, thinking it will cost more

than will be returned. I know to the contrary. We usually feed bran all the year.

A good cow well cared for will clear you a net profit of from ten to twenty dollars yearly. I mean net profit—that is what is left after counting full price for feed, labor and trouble. These days, on most farm products, it will hardly be safe to figure too closely for profits, lest they might be found on the wrong side of the column. The cows will carry you through all right every time, either in a dry or wet season.

I have not one word to say against the beef raising industry. If rightly managed it is a good and profitable business. Many farmers in this county are very successful in buying their steers in the fall and feeding through the winter. Others raise them from calves and think it the safest way. As we have plenty of good pasture land I rather like buying light cattle early in the fall and keeping them nearly one year. The conditions being favorable; either of the above methods, if properly managed, will prove quite satisfactory. The dairy requires more labor and care, but in my judgment is the safest and most profitable of the whole.

THE FARMER'S RELATION TO THE LAW.

HON. A. E. COLE, Fowlerville, at LIVINGSTON COUNTY Institute, Howell.

In a general sense the farmer's relation to the law is the same as that of any and every other individual. There are many phases and features of the law which the farmer never comes in contact with; there are other features of it in which he is intensely interested and in which he is continually coming in contact

What are fixtures and pass with the sale of the land is a question of importance. Carpets, curtains, pictures, stoves, etc., are personal property and may be carried away with the owner upon the sale of the land. Fences of all kinds and fence materials which have been once used, but which may be taken down and piled up for future use in the same place, are a part of the land and go to the purchaser. New fence materials which have never been built into a fence will not pass as a part of the land. If they are not especially reserved in the deed they become the property of the purchaser, notwithstanding there may have been a verbal agreement with the grantor to retain them. Being a part of the land they pass by a deed of it, and a mere verbal agreement to the contrary will not be allowed to set aside a deed, which is a written agreement. This is because of the rule that parole, verbal or spoken evidence is not admissible to contradict or vary the terms of a written instrument.

As soon as a crop is gathered or severed from the ground it becomes personal property, and anything that is personal property can be moved.

BUILDINGS BELONG TO THE LAND.

All buildings of whatever nature, standing upon the land, go to the purchaser. It is not necessary to mention them in the deed; being a part of the land they pass with it. Everything which is a part of any building on the land goes with it, as the doors, blinds, shutters, keys, furnace, grates and, in fact, everything which was intended by the owner to be a permanent part of the building. Any of these things which were removed temporarily at the time of the sale are still a part of the building. Trees of all kinds growing upon the land are a part of it. All manure made in the ordinary course of the carrying on of a farm pass upon a sale of it as a part of the land; it makes no difference whether it is scattered in the fields or piled up in the barn-yard or in heaps under the barn windows or piled under cover. All farming implements and articles of a movable nature are of course chattels and can be carried away by their owner upon the sale of the land. Pumps, sinks, etc., fastened to a building are a part of it in law. The question as to whether a farm bell is a fixture or personal property is somewhat mooted. The Supreme Court of Texas, I believe, has held that a farm bell is not a fixture, and the Supreme Court of Massachusetts has held that it is.

Every man's farm extends to the middle of the highway. It is almost the universal doctrine that the land in the highway belongs to the owners of the adjacent lands. If a farm is sold and described as bounded by a highway it extends to the middle of the same, unless the description clearly excludes the soil of the highway.

Of course the land in the highway is burdened with the public easement or right of travel there by the public. But every beneficial use to which it can be put, which does not interfere with the public right of passage belongs to the adjacent owners. The grass may be cut and carried away by them. Then, too, if the road were ever discontinued the land in it would revert, free of all encumberance, to the adjacent owner.

HIGHWAYS.

Most farms are bounded on one or more sides by a highway. Every highway is defined as a road which every citizen has a right to use for the purpose of travel, in any orderly or proper manner, either on foot or any reasonable mode of conveyance. The public has no other right in them save that of travel and repair. Our Michigan Supreme Court has held that persons using horses for travel on the highways have no superior rights over those traveling by other permissible means, and that the fact that horses were frightened by a steam road engine is not of itself sufficient to render the owner of the engine liable for the injury resulting; in other words, the steam engine in the highway is not necessarily a nuisance.

Every entrance upon the lands of another which is not licensed in some way is a trespass. It makes no difference whether the lands trespassed upon are enclosed by a fence or not. If there is no fence the law encircles the land with an imaginary inclosure, to pass through which is to break through the close and commit a trespass. For the mere entering upon the land only nominal damages can be recovered and there are some trespasses which are said to be excusable altogether. Trespasses may be committed not only by a person going himself unlawfully upon the lands of another, but by sending his servant there, allowing his domestic or other animals to escape there, or by casting inanimate objects upon the land. If one throws sticks or dumps his rubbish on the side of the highway near another's land or throws stones at another's house or buildings, it is a trespass. If a master directs his servant to commit a trespass the master is liable. If one's cattle, sheep or swine go upon the lands of another and there do damage it is a trespass and for which the owner is liable. The subject of

LINE FENCES

between adjacent owners is another question in which the farmers are intensely interested. The legislature has passed a law upon this subject which bears principally upon two points. It provides that partition or division fences between adjoining farms shall be maintained in equal shares by the adjacent owners; and they take from the owner of lands his right to sue the owner of trespassing cattle unless the lands are enclosed by fences of legal height and strength. The statute further requires adjacent owners to maintain division fences in equal shares, that is, each must build half of the fence, and if they cannot agree which half each shall build, or if either refuses to build his share, the law provides a method by which the respective portions to be maintained by each may be determined, and by which either may compel the other to build his share. Of course adjoining owners may agree between themselves and such agreement shall be valid while it remains in force, and mere parole or verbal agreement of this sort is not, however, binding upon subsequent owners and will not bind the parties to it longer than they wish to proceed under it. The statute further provides that the agreement relative to line fences may be put in writing and filed with the township clerk, which shall then become binding upon all parties always and upon subsequent owners or occupiers of the land. When the parties cannot agree and one of two adjoining refuses to build his half of the partition fence, then the law provides that the fence-viewers may be called upon to decide the matter. The fence-viewers are the overseers of highways, or path-masters as we call them.

The fence-viewers make their report to the supervisors and the expense of repairing the fence is assessed by the supervisors on the delinquent owner.

The Michigan farmer who would inform himself thoroughly upon this question should read carefully chapter 21 of Howell's Annotated Statutes.

A PLEA FOR THE EDUCATION OF THE FARMER'S CHILDREN.

PROF. L. A. SNYDAM, Richmond, at MACOMB COUNTY Institute, Richmond.

History tells me that all the great reforms have been made by the common people.

On the fields of Marathon and Thermopylae, it was the hardy, rugged mountaineers who kept back the hosts of Persia and preserved the independence of Greece. It was the stern, heroic and virtuous character of the Romans that enabled them to carry their conquering arms over nearly all the then known world, and our political institutions of today are founded in the laws which they established for the government of that vast empire. The teuton herdsmen and peasants, overrunning Europe, added to the Roman idea of law their love of individual liberty, and the modern nations of France, Germany and England sprang into being. When the Barons of England were struggling for the mastery, it was the common people who came to the aid of the king, and we have a united England, and a little later it was the common people who wrested the authority from cruel and unjust kings and placed it in their own house of commons, and we have the free England of today. It was the common people of America that made the Declaration of '76 possible.

Thus we see that all the great reforms and great movements of the past have been made by the common people. And the historical significance of those reforms is just in proportion that the reformers were educated and advanced. Where the common people of a nation are educated, there we find a nation free and prosperous, as France, Germany, England and the United States. The nations of China, Japan, Russia and Spain are despotic just in the proportion that the people are ignorant. The safety and greatness of a nation depend upon the education of the masses, and just so far as the masses become enlightened, just so far will that nation become prosperous and great.

The education of our children is not a privilege; it is a duty, and a duty to our ancestors and to the State, and when we say a duty to the State we mean a duty to the people of the State—to ourselves—our posterity. For the educational advantages we enjoy we are indebted to our ancestors of the past—the common people. Let us sustain their work and, if possible, build grander, nobler structures, so that our children may be proud of their ancestors as we have been proud of ours, and the only way we can do this is to support the schools, and to offer every inducement to our children to gain an education—an education that will better enable them to meet the responsibilities of life.

We have seen that the reforms of the past have been made by those who toil. And may we not say that in the future the safety of our institutions will depend upon the education of the toilers? If this be so, it is our duty to educate our children, and especially the farmer's children, as they constitute a large majority of those who toil. And further, because the farmer's children have a strength of character and power of overcoming difficulties not possessed by any other class of children. I do not expect that all farmers' boys will enter the professions, but we want educated boys on the farm. We want farmers who can think for themselves and not allow scheming politicians to think for them. And till this is done the farmer can look for no betterment of his condition.

I believe that the education of the farmer will settle the great political problems of today. Your ancestors have entrusted to you this republic and those institutions which they prized so dearly. I know you will be true to that trust and that in the future greater reforms and grander achievements will be accomplished by the educated sons of toil.

THE WIFE'S SHARE IN THE OWNERSHIP OF THE HOME.

MRS. ELLEN CARLETON, Onekema, at WOMEN'S SECTION, MANISTEE COUNTY Institute, Bear Lake.

The life of woman is instinctively the home life; away from it she lives a half starved existence. As a child she plays keep a home, as a girl she dreams of a home of her own, as a young woman she enters one. The purest thought and

sentiment of life surround these homes. As we but pass them, we are thrilled with the cozy contentment they express.

In advanced years the wife's thought turns back to the early home; to her strong young husband as he planted the orchard, the children playing among the growing trees, the maidens that under the blossoms dreamed of yet other homes; the sons that came to her to tell of some herculean feat performed.

Has the wife not earned this home by the pure love she has surrounded it with, like a halo from childhood to age? And what the shock that too often comes and when she is least able to bear it; when she is told that the home is not actually hers, the real ownership in vested in another. She has a sort of life interest in it that will furnish her with bread; "the wife's dower interest of a third" they call it. May be she will have to live with John and his wife, whether she can or not, to receive the bread not exactly manna from heaven.

Why are not our homes held by joint ownership of husband and wife? T. B. Terry has written and said much on this subject. Why do husbands not listen and place the property so the wife need not fear being left without a home? When the husband is sick is not the time they wish to speak to him of business settlements. We are told that the laws of Michigan favor the wife who is a property holder more than the husband. While that is true there are so few women that are holders of property that the law applies to the few, not the majority. Nor would the real wife wish the provisions of the law as it now stands carried out. They may be applicable to some woman in Philadelphia, but not to our Michigan wives.

A man lately published the fact (and signed his name) that both he and his wife worked out the first two winters after their marriage to secure the money for the payments on their home. He states in five years he held the deed. He did not refer to her then, she may have been a back number. Another husband finding he must leave wife and child worried over the slender provision he could make for them until his mind became unsettled and he was legally incapacitated for making any provision.

POTATO GROWING IN CENTRAL MICHIGAN.

C. F. KIEFER, Borland, at MECOSTA COUNTY Institute, Remus.

The best soil for potatoes is a black sandy loam, with a good subsoil, low enough to be always moist, but not wet. Plow the ground in the fall or as early in spring as possible to a good depth, about 6 or 7 inches. If sod is plowed in the spring by all means follow the plow with the roller and immediately after with the harrow, to prevent evaporation of moisture. Drag the ground over every week until you are ready to really fit it for the crop, about the second week in June. Now put on your cutaway or a good stiff spring tooth harrow and pulverize and smooth the ground until it resembles an onion bed. The past season I marked out the ground deep with a common shovel-plow, dropped the seed and covered with a five-tooth cultivator with wings. Within a few days after planting use your smoothing harrow and crop the old marks, thereby filling them up more, and when the plants are breaking the ground repeat this operation. All weeds which germinated up to this time have now been destroyed.

The cultivation after this is with a five-tooth cultivator with wing attachment, throwing the dirt over into the rows amongst the plants, paying no attention if some of the vines are covered up. Keep up this cultivation until the vines are so large that you can no longer get through them, remembering to let each succeeding cultivation be shallower than the preceding one. If there should be any stray weeds left in the hills, go through and pull them out or cut them off with a sharp corncutter.

The secret of success in potato culture is persistent and thorough cultivation; cultivate at least once every week and be sure to do it after every shower. Never let the ground crust over or bake.

As soon as danger of freezing is past in spring I spread my seed potatoes on the floor of an old house where they are exposed to the light, and shovel them over occasionally to prevent them from sending out long sprouts. I use undersized potatoes, those that are a little too small for market; cut them in three or four pieces. If large potatoes are used cut them to about two or three eyes to the piece and plant one in a hill. If the soil is sandy and hot a better stand may be

obtained by planting whole potatoes with a hand planter, but I never yet failed in having a satisfactory stand.

For main crop the best time for planting is about the middle of June. Diligent cultivation will keep your vines improving during the dry part of the season, then when showers come they will fairly jump.

Use Paris-green when the bugs are small and oblige them to eat it by putting it where they are; don't make them wander all over the vines to find it, as they are not swift walkers and travelling in the hot sun is unpleasant.

At digging time we pick the potatoes up in baskets or crates and draw them into an out-door cellar daily; leaving ventilators open until winter sets in in earnest.

SUGAR BEET GROWING.

J. W. LOCKE, Laporte, at MIDLAND COUNTY Institute, Midland.

Plow the ground deep about the first of May, in this latitude. Roll and drag thoroughly. Plant about the 20th of May, in rows from 21 to 30 inches apart, and four to five inches between seeds in the row. Depth of planting about one inch is my belief.

The best sugar producing ground is clay loam, well drained, with plenty of sunshine. The field must be free from weeds and shade trees. When the plants are in the second and third leaf commence to cultivate carefully. Next time over cultivate deeper with spike-tooth cultivator. I also find a one-horse weeder very servicable. When beets are well along, hoe thoroughly with beet hoe while cultivating is in progress.

All seed should be screened, only planting the best. The amount per acre, six to eight pounds; using the most approved beet drill.

When harvest time is near, consult the manufacturer; when the order is made on your number of contract for beets proceed at once to dig and top by the most approved plan. There are several plans in view—two patents since last harvest to top and pull with—horse power and man power.

The manifold blessings derived from beet sugar manufactured under this government are shown by the fact that it saved in 1898 the importation of between five and six per cent of sugar imported and consumed every twelve months, keeping the money in our own country for circulation. The one hundred million dollars sent abroad annually for sugar will be saved in whole or part and laid out in improving roads and building factories. Labor, science and capital will go hnd in hand under the protection and guidance of our government, on our own soil.

The demands for beet sugar are increasing yearly at a rapid rate. Education, science and refinement aiding in its use and production.

It has already been demonstrated that what we subsist on has its particular effect on the mind and body of man. Pure sugar will find its own market. As the world is civilized the demand for pure sugar increases.

SOME REFORMS IN EDUCATION.

STEPHEN H. LANGTON, Ida, at MONROE COUNTY Farmers' Institute, Dundee.

What then is to be done in this matter? How shall we approach the problem of correcting the artificial education of rural and city schools? It seems to me that the requirements of teachers ought to be changed. The superficial knowledge demanded by the State Department of so many subjects ought to be forever put aside. If a teacher has the ear marks of true culture; namely, a trained mind; a thorough knowledge of mathematics and English, he or she is ready to help the children of the common people in the possession of that inestimable treasure, true culture, which is the only practical education a child can have. In real common sense, in ability to think for himself, the average teacher in the district school is below the average farmer. And this is through no fault of theirs. Not having the ability or time to master so many subjects, they end by having a mastery of none. The old fashioned school teacher who knew how to cipher, spell and write

well was really a better teacher than most of our teachers today, who might be described as suffering from mental indigestion.

The immense advantage of thoroughly knowing our English language can be brought before you in many ways. To teach civil government, physiology and botany to district pupils before they know English is like trying to cut down a tree with a hoe. This is the point at which so many farmer-boys get discouraged and give up education entirely. The teacher not knowing mathematics or English himself leaves the students stranded just where they need a strong pull to fetch them over. If one does not know the meanings of words or if the thought is too hard for the reader he gives up in despair, progress into broader fields of knowledge is closed. In other words mathematics and English are the key to all education with us, and without them the other subjects never can be mastered. The only way to overcome this fault is to cut the number of subjects demanded from teachers upon examination square in two and then double the requirements for these branches.

More than one great man has warned us in late years against

AN ARISTOCRACY IN EDUCATION.

If you draw a fast and hard line against the uncultured class, telling them that culture is forever beyond them, they will rebel and with the ballot in their hand will overturn the fabric of republican government. The cesspool of politics is corrupt and hopeless. The school alone is the final hope of reform; the way to the masses of humanity. And the school system, too, in the hands of men masking behind a superficial education, has likewise fallen a prey to the political monster. Let men who deem the political machine too hard for them to bear look to it, lest, by their neglect, the masses be irretrievably lost. We call ourselves a practical people. That word sounds well to our ears. Men boast about our ability in accummulating money.

We plan to get ahead, no matter how. This practical spirit will ruin the republic; will reduce society to classes which can never be broken. Business, politics and even religion are used for the indescribable scramble for money, affluence or honor. Lastly, this spirit has taken hold of that beautiful creature of western republicanism, our school system. If you want to enthrall the masses, to make them forget their manhood, to dull their intellects and their ambitions, then take culture from them, put them into the hands of superficial, practical teachers and the way is short and soon traveled. If the son of the farmer is to have an equal chance to rise to the sphere to which his ability entitles him, then this so-called practical teaching must lose in the conflict. We don't want men like one-legged stools, that can't stand alone, but thinkers, readers, intelligent and moral citizens. From the experiences of the past I trust we have learned our lesson and it is to be hoped that we, casting aside false systems with enticing names, will follow the only path which will avoid a threatened doom to the common people.

EDUCATION OF FARMERS' DAUGHTERS.

MRS. MARY SHERWOOD HINDS, Stanton, at MONTCALM COUNTY Institute, Lakeview.

We discuss in our Farmers' Institutes and meetings unjust taxation and other economic questions with becoming tenacity. We hear the oft repeated lesson of balanced rations for cows, care and exercise of breeding animals. But just how we shall best equip our girls and boys that they may meet effectually the great responsibilities that must shortly rest upon them, is only a secondary matter. It seems more needful that we look to this important question in our gatherings. A statistician recently informs us that, in New York City for example, 96 out of every 100 of the recognized successful men, including bankers, railroad presidents, large manufacturers, vessel owners, doctors, ministers, etc., spent the first twenty-five years of their lives on farms or in small villages. Do we as parents think seriously and with the earnestness which the subject demands, that the destiny of the whole world must soon be given over to the youth and little children of the present, and that they will become the great and learned men and women on whom shall rest the burdens of the nation's life for weal or woe? Do we realize how important a work there is for us to do, in molding and shaping their characters, that they

become strong self reliant men and women, able to perform well their part in life's great, unplayed drama?

Whether this essential education can best be obtained at the University, Agricultural College, or in the common school, must depend largely upon the financial ability and choice of personal occupation or pursuit of the persons interested. True education is the harmonious and symmetrical development of the powers and faculties of the human mind and soul. A good practical education will enable one to lighten the care of the farm, carry on the duties of the household, cheer the home and live a pure life.

Let us consider the daughter's education along three lines. First, fitting for a broad general culture; second, for the practical; third, for that which gives broader sympathies and increases the power of enjoying life. In the first a foundation is gained; under the second comes the training of the house-keeper and mother. Success depends upon the ability to manage. It is an educated mind that can plan and calculate and is able to solve the problems of existence—according to Carlyle's theory of lessening the denominator rather than increasing the numerator. It is very necessary that every girl should know all about the art of housekeeping, for it is in the home where she wins her highest and noblest achievements. In acquiring the third, at the present day, women are said to be losing sight of the chief end of woman. Not so, and when this is realized then shall the true new woman come forth, and train her children for the use and service of the world into which they are born. Farmers' daughters may become farmers' wives, and they should consider themselves as much responsible for the success of the family as their husbands. They should know something about business, and there is no way to this so effectually as to give them an opportunity to do business for themselves. It is worth everything to a woman, if by misfortune it becomes necessary for her to look after property and to take care of herself, to have had some practical knowledge of what she has to do. The knowledge derived from study, however well the theory may have been learned, is never equal to practical experience.

FORESTRY.

J. J. GEE, Whitehall, at OCEANA COUNTY Farmers' Institute, Shelby.

Time flies and it is a surprise to note how quickly a tree grows. To illustrate how soon the second growth of oak or pine will have value I would say that by measuring the diameter of some of the second growth oak that has been brought into market this winter and counting the rings that indicate each year's growth, I found that trees having a diameter of 7 inches had 21 rings, and those of 9 inches diameter 27 rings; thus showing a diameter growth of 1-3 inch per year or one inch every three years, and this upon poor light sand, and pine grows even more rapidly than oak. Thus you see a tree large enough for a post has been grown from an acorn in less than 25 years.

Unfortunately for the coming generation is the fact that the present generation in this State have been tree destroyers; and there is some reason for it, but not a sufficient reason for the extreme to which we have gone. When the backwood's man, and this is what we all were a few short years ago, had to contest the ground with trees, stumps and roots for fields to cultivate, he looked upon the hardwood forest as his worst enemy. Almost every one having the short-sighted view of today's gain ever before him, ceased not to wage war upon his woodland, and before he was hardly aware of the fact he wakes up to find that everybody has been doing the same. He is out of wood; his neighbor is in the same condition, and today the writer knows of dozens of farmers in this county who are driving one, two and three miles from home and buying their fuel. And the question comes up what are we each to do for ourselves who still have wood lots? Most of you doubtless see the wisdom, and in fact, the necessity of only cutting for wood such trees as have reached maturity and show signs of decay, or such large trees as standing in the midst of smaller ones may impede their rapid growth, always being careful not to destroy the young in felling the larger, if possible.

IN REGARD TO SHADE ALONG THE ROAD.

I firmly believe every highway in Michigan where the country is devoted to farms, should be planted to trees, either forest or fruit, and receive thorough cultivation and care for at least five years. Here is a good chance for investment on land that is not taxed and that doesn't belong to you, rent free, but from which you can have all the crop. This is no share business. The public says you can have all you can grow on it and not a cent for taxes. How does it happen that the wide-awake Yankee, who is always looking for a good bargain, or the industrious German, who will sometimes cultivate even the fence corners, will permit such a chance to escape? Did you ever figure how much improved fertile land lies unproductive and waste in a single improved township? The highways that cut a township into sections, allowing four rods to the road, contains 144 acres, but the intersecting street will increase this area to nearly or quite 150 acres, which would give to a county of 16 townships 2,400 acres. This would give to the 550 townships that lie south of and including Muskegon county latitude, about 1,340,000 acres. Some may ask what shall we plant? Some might prefer a sugar bush, others an apple orchard. If you plant for generations yet unborn, the walnut is worthy of attention. If the sale at Cassopolis a day or two ago is any criterion—some of you may have read the account—I saw the report in two papers, stating that 51 black walnut trees had been sold for $10,000, and a cut showing the section of a tree accompanied the report.

I advise sugar maple first on account of their beauty and value. By planting a row of trees six feet from the fence and one rod apart in the row you get 80 trees to the 40 acre farm, and if you own both sides of the highway you have 160 trees. One rod is not too close when you consider that the roots can feed to the center of the road on one side and perhaps take in two or three rows of corn on the other, but by the time the corn suffers from the tree exhaustion you will be able to harvest enough maple syrup to sweeten the whole family for a year, or sell enough to pay the farm taxes. I have a native sugar bush of 100 trees from which I often make 50 gallons of delicious syrup. Should you prefer an apple orchard, then plant that vigorous upright grower, the Northern Spy. You need not be in a hurry to eat the fruit from this variety as it won't be there, it just keeps right on growing until it gets to being a great large handsome tree and then some year when all other varieties are a failure and prices are away up out of sight, this particular sort will surprise you, or your grandchildren, with a magnificent crop of the finest apples in the United States. The reason for this peculiarity is found, I think, in the fact that the Spy does not blossom much until about a week after the others and when those adverse conditions of weather, which sometimes blast the apple crop while in bloom have passed this tardy sort comes out under more favorable conditions and produces its luscious crop.

Then plant, protect, and cultivate, should be the motto of every farmer in Michigan. It will furnish shade to the traveler, fruit for the family, and sugar to sweeten it, beautify the landscape and add value to your property.

WOMAN'S WORK ON THE FARM.

MANDA L. CROCKER, Shelby, at OCEANA COUNTY Institute, Shelby.

I know women who make their work on the farm drudgery; also know others who enjoy rural cares and are happy as birds in the hedges. Work, like life, is not "always what you make it," but a great deal as some one else makes it for you.

If a farmhouse is built with an eye to comfortable convenience; woman enjoys her indoor duties. Money is not always the prime factor of convenience; but always "gumption" or good common sense.

We know there is more work for a woman on the farm than in town. To this fact so many ascribe the overworked condition of country women. This is a mistake. The question for women, as well as men, is how do you work? To understand how to do a thing robs it of tedious failure. To understand dairy work means restful labor. An ounce of clear insight is worth a pound of strength.

Once a woman was asked: "What do you do on the farm?" "Oh," she answered, "everything outside of the two ten-acre lots over there." This extravagant assertion, however, covers more of the actual ground than one might think; this is

simply drudgery. No wonder women get "fagged out," condemn men, farms and all, and hate farm life. The outside work tasks them, soul and body; puts the house duties in a jangle, and—saves their husbands 25 cents, maybe.

What is the outside gain to the inside loss? If system marks the indoor work, woman has time for outdoor work when she comes to it; then, it is recreation, not drudgery.

To weed in the vegetable garden, make a circuit of the barnyard, see after the biddies and "mother up" some stray or crippled creature is a sort of outing. A real womanly woman on the farm "mothers" almost everything on the premises. All the odd chickens, hapless lambs, horses, cows and even the farm-dog, chirk up when the women appear. To comfort and coddle the dumb friends of the farmer's family, then, is pleasurable duty.

The cultivation of flowers—for flowers and women should never be far apart—is pleasant, restful labor. The gathering of fruit for table and canning purposes is another avenue of taking in "fresh air fund."

One does not grow weary of real hard work as soon as of "puttering 'round." It takes more strength to vacillate, more grace to "putter," than to work systematically all day. Let no woman on the farm have "trotting days;" a good trotter doesn't walk well.

In closing: If a man on the farm desires his wife to look tidy, young and cheerful, he should see to it that she does not carry the water from a "pocket" several rods from the house, split the wood, pick up his tools after him continually or go half a mile for potatoes for dinner. He should see to it, also, that she need not spend half the forenoon of three days in the week preparing dyspepsia doses to tickle his palate and distract his stomach.

The less pastry, the better the woman's nerves, the better the man's stomach. And, of course we all know the way to a man's heart lies directly through his stomach.

PRESERVATION AND PROPAGATION OF FORESTS.

E. T. MERRILL, Reed City, at OSCEOLA COUNTY Institute, Reed City.

It is now established without a doubt, that all cut forest lands will reforest themselves, if fire and all kinds of stock can be kept out. But in nearly all of the northern counties, and along and at the head of all of the principal rivers, there are now vast tracts of stump land with from 10 to 20 years of young growth of timber upon them. Therefore, if the following laws were passed, Michigan would soon have a forest reserve.

First, that all lumbermen and others that are cutting timber shall at the proper season of the year, and at a time when it shall not endanger the growth upon other lands, burn and destroy all brush and refuse upon their cut lands. If this law had been passed 30 years ago there would have been but few great forest fires in Michigan.

Second, that between the first day of April and the first day of November, any hunters, fishermen, campers, or others that start an outdoor fire of any kind or for any purpose whatever (except in clearing lands, and burning refuse at times that fire will not run, and according to law), shall before leaving the spot entirely extinguish all fire, and if they shall go away leaving any fire or live coals, shall be subject to $1,000 fine or one year imprisonment, or both.

Third, All lands held by the State as tax lands should be held as a forest reserve and all lands that can be secured by donation from lumbermen or others should be added to such reserves.

Fourth, Any private owners of lands in Michigan, who will set them apart *forever*, as forest lands, the cutting of timber thereon to be subject to the laws of the State, no timber to be cut except of a certain size, and all refuse from said cutting to be removed from the land, and one-fifth of the stumpage value to be paid to the State when cut, will be exempt from all taxes upon said lands. All taxes heretofore assessed upon said lands must be paid up to date, before such lands can be set aside.

Fifth, That each county and township where these timber reserves are located, shall be exempt from State tax in the proportion that they lose taxable lands, so

that the burden of holding forest reserves shall fall upon the whole State, and not upon a few counties and townships, as it otherwise would.

Sixth, That laws shall be passed with penalty severe enough so that it will not take an army of fire wardens or special officers to keep trespassers and others from injuring these reserves. It should be five years' imprisonment for trespassing and cutting timber on these lands, with a bounty paid to the informant, and the township and county officials, with the game wardens, would be sufficient to enforce the law, and any parties buying stolen timber from these lands should be subject to a heavy fine and imprisonment.

And we would strive to impress upon the farmers the urgent need of setting aside a portion of their farms for a wood lot with no stock allowed to run. Stock of all kinds destroy the young trees just as they make the first two leaves in starting, and I know of many old cuttings where farmers tell me that a second growth of timber never started, but in every case it was where stock was roaming over the lands. When you get back so far from the settlements that no stock runs, timber always starts in a few years, even in old and hard-beaten tote roads. Very little if any seeding will ever need to be done in Michigan to get a forest growth.

The great danger at present is that our stump lands are fast passing into the hands of owners outside of the State, much of it being sold in large groups at from 10 to 30 cents per acre. There is no chance to save any of the old forests, for they have passed into the hands of parties who will cut the timber very soon. In fact the old forests of northern Michigan will disappear so quickly and so completely as to startle those people who believe that forests have a climatic influence.

THE POETRY OF FARM LIFE.

MRS. SUSIE HAYES, Biggs, at WOMEN'S SECTION, OSCODA COUNTY Institute, Mio.

Did you ever pause and think how much real poetry goes to waste in home life for lack of appreciation? And how hard it seems for the busy housewife to stop planning to enjoy the blessings God has placed within her reach? How much happier our lives might be if we could stop long enough to draw one long, deep breath of rapture over a bit of bright green landscape, a nosegay of flowers, or a beautiful sunrise or sunset. It would brighten a whole day and might help to drive away the wrinkles of care that all too soon mar our faces. We are too apt to forget all the beautiful possibilities of life and to remember only the hard, grinding necessities of our lot, and plod on no better for all the bright, beautiful things God has given us to enjoy.

We should teach our chilldren to appreciate all the beauties of farm life, to love nature and keep themselves pure; teach them the true nobility of life. That our daughters may be

"Not beautiful in curve and line,
But something more and better;
The secret charm eluding art,
Its spirit, not its letter.
An inborn grace that nothing lacks
Of culture or appliance;
The warmth of genial courtesy,
The calm of self-reliance."

And that our young men may be described by these words from the same poet:

"Framed in its damp, dark locks, his face
Had nothing mean or common;
Strong, manly, true, the tenderness
And pride beloved of woman."

Let us teach our boys in all things to be honest, honorable and just; not to despise the little courtesies that make the poetry of everyday life. The lack of courtesy is the crying evil of the farmer's life. Let us make an effort to rectify this evil.

Much of this love of the beautiful is acquired by education. But some are born with their souls full of poetry. There are some who seem afraid to give voice to their beautiful thoughts for fear of being misunderstood or laughed at. We must all learn to appreciate these thoughts. Our Father gave them to us that we may

give pleasure to those around us. Let us teach ourselves to appreciate all the poetry pulsing and throbbing through this great, grand world of ours.

Our lives should be in harmony with nature, to see its beauties. We thank God for life, food and clothing. Do we ever thank him for our surroundings?

I was driving along Tawas Bay, watching the waves wash upon the beach and break and fall back, and I thought how beautiful. Yet we stand here and human life surges around us, beautiful thoughts, beautiful deeds, the very poetry of life flowing and breaking around us, and we all unconscious of their beauty. Oh, if only the scales might fall from our eyes, that we might take into our hearts and lives all the beauties of life.

PRIVILEGES OF THE AMERICAN FARMER.

STEWART GORTON, Luzerne, at OSCODA COUNTY, Institute, Mio.

The American farmer has no just appreciation of the dignity of his occupation, of its importance, or of the superior advantages he enjoys. These conditions are best elucidated by comparison with the condition of farmers in other countries and by comparison of farming with other occupations.

Agriculture is the one occupation without which the existence of the human race would be impossible.

"The hand that holds the plow feeds the world." The first of all human necessities is food and clothing. The materials for these are furnished by the farmer. Farming is the foundation on which the whole superstructure of human society and achievement is built, and without which, the existence of the human race, with its achievements in the arts and sciences, religion, law, government, music, painting, social culture, and all that goes to make up the sum of human happiness, could not be.

The American farmer occupies the vantage ground amongst all the farmers of the world. He is the most refined and intelligent; he is the best educated; he is the best liver; he dresses the best; he lives in the best houses and maintains the best homes; he is the best and most prosperous and progressive farmer in the whole world. Still he has much to learn about his occupation. The science of agriculture is in its infancy. The possibility of the earth's productiveness is comparatively unknown.

A disposition to acknowledge our ignorance is, perhaps, one of our greatest needs; for it must be conceded that we American farmers, with all our other having, have plenty of egotism. Occasionally in our lucid intervals we own up to ourselves that we don't know quite everything, and that "Everybody knows more than anybody."

Right here, and when we are in this frame of mind, comes in the value of our Farmers' Institutes. Men who have spent the most of their lives in a particular branch of farming, and by long years of experience in all the details of that particular branch have become experts, are sent here to give us the benefit of their superior knowledge. All this varied and valuable knowledge is made available to us through the instrumentality of the Institute. One of the particular advantages enjoyed by the American farmer is facility of transportation. The nearer the producer is to the consumer, or the less it costs to put his products in the market, the better are his net prices. Railroads have brought the producer and consumer very near together; enhancing the price to the producer and reducing it to the consumer.

We are sometimes inclined to find fault with freight and passenger rates on railroads; to say that railroads are not paying their just proportion of tax; to say that they are getting rich out of the farmers and other shippers; all of which may be true; but it would be a sad day for the farmer if our 186,000 miles of railroads were to go out of business. While our railroads may or may not be charging exorbitant rates, never in the world's history was farm produce moved as cheaply and expeditiously as today, and in no country as cheaply as in America.

The average freight rates are now about seven-tenths of a cent for each ton carried a mile. In 1867 the rates were three times that amount. The average rate for passengers during 1898 was about two cents per mile. Both freight and passenger tariffs are higher in every other country; and America has the best and safest service in the world. During the past year our roads have carried 550,000,000

passengers—only one in 2,250,000 was killed. Riding on American railroads is safer than staying at home. With fair wagon roads, with our lakes and rivers and canals, and with half the railway mileage of the world, the American farmer enjoys the best transportation facilities in existence. The slow, expensive and unsafe modes of transportation in the old world countries are some of the causes that have kept the farmers there in a condition of practical serfdom. These farmers are living like beggars, while the American farmers are living like kings. Money, brains, enterprise, work—these are the forces that have sent our country to the front.

Americans are possessed of vivid imaginations. But what has imagination to do with plowing or digging the potatoes? There never was a useful implement or machine of any kind—a plow, a potato digger, a printing press, or a harvester—until this imagination with its deft finger first painted the picture and hung it in the workshop of some man's brain. A man's hands and brain are partners in this great struggle of life, and the brain is the senior.

PRACTICAL POINTS OF INTEREST TO FARMERS' WIVES.

MRS. CORA MOORE, Elmira, at WOMEN'S SECTION, OTSEGO COUNTY Institute, Elmira.

The first to be considered is the home. It is only a woman who can turn a house into a home. A house is not a home unless it contains food and fire for mind and body. In the majority of farm homes the work of preparing the food and keeping everything in order falls upon the wife and mother. She must be patient and sweet tempered, and remember that no high or noble position was ever attained without bravely bearing some cross. No woman can build a most precious home who does not understand that she must, for the crown that is set before her, cheerfully accept much labor, suffering, and self-sacrifice. Housekeeping can be raised to a science, or reduced to a mere menial occupation. It requires education, adaptation and natural tact to fill the position with satisfaction.

Home means so much. It means all that makes life worth living. There, if anywhere, we are genuine. It is for the home life that we need to educate ourselves. An important part of our education is economy. We need to learn to save our strength as well as our dollars. We have compared, briefly, the majority of farm homes with those of the city and have said that, however small or plain a home, it can be dainty, neat and cheerful. We can place useful and instructive books and papers before our families, that they may be fully occupied, and keep in touch with the world around us. We can adorn the home with fruit and flowers and with patience and perseverance.

Beautify the farm house and grounds. One says: "The idle man is the devil's cushion," and a woman has no more right to be a loafer than a man. Every woman should have some source of income that she can call her own. I would advocate no sordid service in the family. But I do think that toil without recompense is as husks to the soul. I suggest dairying, poultry raising, and gardening, as profitable for farmers' wives. I especially advise the two latter, as we not only get dollars out of it, but the much needed outdoor exercise. "Our dainty notions have made women such hot-house plants that one-half the sex are invalids."

There is a larger per cent of the inmates of the insane asylums farmers' wives than of any other one class of people, and the cause is attributed to the monotonous, hum drum and drudgery of their lives. But farmers' wives are not all slaves; and who could be content to live in the city, laden with poisonous gases, after living in the country and reveling in God's best gifts, fresh air and sunshine? Here, too, we have many luxuries, such as the products of the dairy, fresh fruits and vegetables, which would put to shame the city markets.

And now, my sisters of the farm, let us so live that the blessings of a clear conscience may be ours to enjoy, and with faith in God, a cultivation of the Christian graces, due consideration for the comforts of others, and with newspapers and periodicals so cheap as to be within the reach of all, and access to public libraries, may we never grow disagreeable, ignorant or discontented.

FEEDING AND CARE OF SWINE.

WINSOR CRANE, Bridgeport, at SAGINAW COUNTY Institute, Saginaw.

One of the essentials of success with pigs is in getting them started right. The first few days great care should be taken not to overfeed the dam. About the third day, clean out the nest and give them new bedding. A cold, wet, filthy nest is death to pigs. In cold weather, if young pigs get very fat they sometimes die of thumps. Thumps is caused by too much fat around the heart and not enough exercise.

At about three weeks old, give the pigs some feed by themselves in a shallow trough. Avoid sour feed; the stomachs of little pigs are very sensitive. Sweet milk, with a little middlings, is good feed for them; skim milk alone is poor feed, but when mixed three pounds of milk to one pound of corn meal, makes good feed. Bran makes bone; oats make muscle; corn makes fat. Middlings is cheaper feed than bran. Hogs should have access to salt, ashes and charcoal at all times.

It takes less feed to produce the first 100 lbs. than it does the second 100 lbs., and much less than it does the third 100 lbs. It takes about 11 per cent more feed in winter than in summer. When fattening hogs on corn, feed but twice a day what they will eat clean, and no more. A pig should weigh 200 lbs. at six months old; have been made to weigh 243 lbs. at five months and ten days old; have been known to gain 35 lbs. in nine days. Cooked potatoes, cooked pumpkins, rape and artichokes, are good feed for growing hogs. Hogs will live on clover hay. We should never forget that the hog is a grazing animal, and of all the feeds grass is the cheapest. In this respect we have advantages that some may not be aware of.

The area most nearly surrounded by the Great Lakes is influenced by the presence of these vast bodies of water. From this cause we have a moist and comparatively moderate climate. Besides this, we are where the cold air of the north meets the moisture-laden return trade winds from the Gulf of Mexico, causing a plentiful and pretty evenly distributed rainfall. Finally, we have a fertile soil. Nothing more is wanting for the production of sweet, luxuriant and nutritious grasses. Thousands of hogs go to market annually with no other fattening except pasture.

That our pork products are not inferior is seen in the fact that we exported $82,971,681 worth of them in 1897. That the hog brings to our country more ready cash than do all other live stock is seen from the fact that the horses, cattle, and sheep and their products exported, amounted in 1897 to $76,375,174; that is to say, our much abused hogs brought to America more of foreign gold by $6,596,507 than did our exports of horses, cattle, beef, sheep and mutton, combined.

WHAT SHALL WE TEACH OUR CHILDREN?

MRS. LILLIA H. POMEROY, Sanilac Center, at WOMEN'S SECTION, SANILAC COUNTY Institute, Sanilac Centre.

Our children will be the men and women of the next century. We are forming the society of the next generation. What will that society be? Good and moral? or vulgar and profane? Do we realize the responsibility? And we are also training immortal souls for time and eternity. Let us consider well what we teach our children.

The character forms very early. We can not tell when it begins to form, and therefore we must begin our vigilance while the child is young or he will learn from others that which the mother should have taught him.

Teach truthfulness, not only by precept but by example. Try not to evade telling truths to the enquiring mind by telling something else that although not an exact falsehood yet leaves a false impression on the young mind. We must tell them of the life of Christ, and that he loved little children and said: "Suffer little children to come unto me, and forbid them not."

We must point out to them the evils of intemperance. Teach them how alcohol and tobacco stunt the mind and body of the growing child. Tell them if they wish to be wise, manly and womanly, they must let stimulants alone. They must not pollute God's image by using that which is unclean.

Each child has an influence, be it ever so small, among his companions. Shall that influence be for good and right, that the world may be better for his having lived?

Train the spiritual, and the temporal will not come far short. Teach the child that when the school life is done, he has only just begun his education.

Teach the child at an early age to know himself, to know his own body. Many of the ills of this world would be avoided if the child were taught the laws of health and how to care for his body.

Children will ask questions, and had not we as mothers better answer their questions than have them answered in a vulgar or improper way by some companion? They will learn somewhere. Answer their questions yourself.

This is a subject which has been very much neglected in the past, but as the world grows wiser we will learn where we have failed in our duty.

As for the temporal, teach perseverance. We can never succeed in life if whenever we put the hand to the plow we turn back. Whatever we undertake we must persevere unto the end. Do with our might whatever we do. Work is the watchword; activity the motto. Whatever our circumstances may be we must teach our children to be able to be self-supporting or we fail in a great duty. Idleness is a great curse to any nation. Each one has some talent. God has endowed each child with some gift. Learn where the talent lies and educate along that line. Each one will succeed best if allowed to follow the vocation he is fitted for.

Then we must study the character of our children to know what they are fitted for. Train in that line but never forget that truthfulness, honesty and sobriety are the main things for a good character, and therefore for success.

BEE KEEPING.

W. J. MANLEY, Sanilac Centre, at SANILAC COUNTY Institute, Sanilac Centre.

Sanilac county ranks among the best in the State in the production of honey. As with other crops, conditions must be favorable for the production of large quantities of money. Good soil and plenty of moisture are important essentials, as they insure an abundance of wild as well as cultivated forage for the bees, and go a long way towards making the successful bee keeper. However, with these conditions, failure is quite possible. In fact, in my experience I have found the business so uncertain, taking one year with another, that I would not think of depending solely upon the product of the apiary for a sustenance. On the other hand, when carried on in connection with my other farm operations, I may say that nothing else has paid quite so well as the apiary.

Bees require attention, and they must have it at the right time. Often the difference of a few days in attending to them would make the difference between success and failure. Honey flows are sometimes very short in duration, only a few days, may be very profuse, and if the bees are not prepared for it, it means I've missed it, that's all. Be ready! is the watchword.

We usually have four flows, during the season, in this locality. First, fruit bloom, then clover, and in the fall, buckwheat, followed by autumn flowers.

I aim to have my colonies strong in the early spring, and in order to secure this I begin the fall before by packing them snugly. This should be done immediately after the fall flow closes. By being kept warm during the winter they are not so liable to get the diarrhea, and they begin to build up much earlier in the spring. I never unpack until settled warm weather has arrived.

I prefer to put on the sections early, as it tends to check swarming; so as soon as the bees begin to whiten the top bars I put on the sections and extracting bodies. I usually bait the supers containing sections with a section or two of drawn comb, as this induces them to enter the supers much sooner than they otherwise would. The plain section has proven entirely satisfactory in the limited test I gave it the past season, but will require a more thorough testing before I adopt it entirely.

I consider it very important that the bees should have plenty of ventilation during the hottest weather of July and August. About the time clover flow begins, I go through the yard with a chisel and a basket of small blocks. I insert the chisel at the entrance and raise the front end of the hive an inch from the bottom board

and block it there. This little kink has paid in dollars and cents. It tends to keep the bees from hanging out in the hot weather, does away with considerable swarming, gives plenty of room for the bees to pass in and out freely, and as a matter of fact I have never known a case of robbing to result from it.

Although I aim to prevent swarming as much as possible, I still have plenty of it. Occasionally two swarms issue at about the same time and I have frequently prevented them from uniting by throwing a sheet over the first to cluster.

The most expeditious way for removing the comb-honey from the hives that I know of, is by puffing a little smoke into the tops of the supers, thus driving down most of the bees and then removing them quickly and piling them up in the yard ten or a dozen high and placing on the top super a cone-shape escape made out of screen wire. A small hole large enough for two or three bees to pass out at a time is left at the top. It is simply laughable to see the way the bees roll out of those supers, and I can soon carry the honey inside.

And now a word about marketing. I try to put honey up in the best possible shape by removing all the propolis, and grading according to quality and color, and packing in glass front cases. Prepared in this way, it finds a ready market at top prices.

FARM POULTRY.

C. P. REYNOLDS, Owosso, at SHIAWASSEE COUNTY Institute, Owosso.

Of all the kinds of domesticated fowl, the hen is doubtless the one the most farmers are interested in. All breeds and varieties have their good points, but for an ideal farmer's fowl, I would suggest the folllowing: Head—A heavy, short bill, yellow or horn colored; head set off with a low single, rose or pea comb. Neck—Medium short and heavy. Back—Medium length; broad in rear and gradually tapering towards the front. Breast—Heavy, deep and muscular. Tail—Medium in length and free from extending spangles. Shanks—Stocky and proportionate to size of fowl; in color yellow, and free from any down or feathers. Skin—A deep golden yellow throughout. Such fowls when matured should weigh from seven to ten pounds each. There are a half dozen varieties that come close to above description. Select any one and you will not be disappointed.

In popular estimation the next farm fowl is probably the turkey. There is money in turkeys when rightly handled. One can not go into turkeys as he would into other kinds of poultry; it is an exceptional farm where one tom and four hens are not sufficient. If you grow turkeys, raise big ones. Practically it costs no more to raise a turkey weighing 20 to 25 pounds by November than it does one weighing from 12 to 15 pounds. Don't be afraid of getting turkeys too large. Don't use a tom weighing less than 30 pounds, hens 18 to 22 pounds each.

The next fowl in order is the duck. Pure bred Pekins are too cheap to bother with the mongrel. The Pekin grows faster, at maturity will weigh most, and is much easier cared for and handled. The Pekin has been bred for practical purposes, and it is doubtless the best market duck. For market raising do not select a breed with colored plumage.

In handling poultry be careful about in-breeding. For those who thoroughly understand it, close mating is all right, but it will not pay the average farmer to follow it. Change males regularly, and do not select anything but large, healthy, vigorous stock. Always use pure bred males of a single variety, and stick to it.

As a rule farmers make a mistake by using too many males with their flock. For several years I have practiced using one male with some thirty or forty hens, and have had the best of success. This year I have a flock of some forty-five hens. With these I shall mate one two-year-old cock, and shall expect good results. Instead of buying a half dozen males to use with sixty hens, buy a third as many and get better quality.

The last phase of farm poultry that I shall touch on is that of artificial incubation. There are doubtless many who are contemplating the purchase of an incubator for the coming season. To those I will only offer a few suggestions. You should buy the machine early, so as to have time to experiment; don't build any air castles until you have run at least two hatches; don't allow yourself to become deluded into thinking that artificial incubation is a child's recreation; bear carefully in mind that you are taking a matter out of the hands of nature, and that

your success depends largely on how closely you are able to follow nature's laws. Don't buy an incubator unless you are able to see one in practical operation, or are satisfied that the make of machine will do all that is claimed for it. An incubator will require attention from at least twice to a dozen times a day. Before you buy a machine first know where you are going to put it; if you are thinking of running it in the house cellar, first read your insurance policy.

My first year's experience in running an incubator was not entirely flattering. Each incubator contained 200 eggs; first hatch, 42 chicks; second, fifty; third, 52; fourth, 47; fifth, 55 chicks. Or about 250 chicks from 1,000 eggs. Had I experienced no trouble with moisture would have hatched at least 750 chicks from the 1,000 eggs. I do not lay result to machine or impracticability of artificial incubation, but largely to my inexperience.

BENEFITS OF EDUCATION TO THE FARMER.

MISS SARAH M'KENZIE, Brockway, at ST. CLAIR COUNTY Institute, Capac.

Religion, morality and knowledge are the corner-stones of any nation. Knowledge will naturally follow religion and vice versa. The deeper man delves in the mines of knowledge, the greater proof he obtains of the existence of a divine being. Morality is the legitimate offspring of the other two.

Remove these pillars from the foundation of this nation, and it matters not how many islands she can hold, how many armies she can subdue, or how many ironclads she can sink. Remove these pillars, and our nation's days are numbered. "It is finished!" will be traced upon the wall by the hand that traced Belshazzar's doom. For have not the wrecks of empires strewn on the ocean beach of time taught us that nations are not made great by lands, or ships, or treasures; but rather by how righteously they conduct themselves among the nations of the world, how just their laws, how virtuous their people?

How does education benefit the farmer? One-half the population of this broad land lives in the rural districts. The remaining half not merely depends on its better half for sustenance, but for its Deweys, its Talmages—yes, even its successful manufacturers, bankers, doctors, lawyers are the products of the farm.

If the nation cannot be powerful without education, existence would be impossible without the farmer.

Farming has got where it requires thinking to make it profitable. Whatever may have been the case in the past, in this, the twentieth century, this era of enlightenment and progress, the farmer who is not educated, the farmer who does not study, is a back number. The farmer must be an earnest student, a deep thinker, a keen observer; for he must bear in mind that a little learning is a very dangerous thing.

It is not every farmer who is fortunate enough to obtain a college education, yet in these days of cheap education, cheap farm books, correspondence courses by mail in almost every branch of knowledge, it is certainly a farmer's own fault if he stays in ignorance. No school room is half so comfortable as his own fireside, no fellow students half so pleasant as his own family.

The study of those subjects that would invest farm life with a new interest and uplift the general sentiment held in regard to it is of the most vital importance to the coming farmer. He must be imbued with a nobler conception of the vocation of his father and stop his mad rush for the city.

The vital reinforcement of city life that leads to prosperity and progress and the leaders and guiders of our republic must always come from the sturdy stock of the farm; but we are not willing to see good looking, good natured, upright, intelligent Jack and Tom, who should, by right training, become influential and successful farmers, rush to the city to become mere "counter jumpers."

The coming farmer should be taught bookkeeping as applied to farm accounts. He should be instructed in biology, chemistry, and higher mathematics. Should know something of practical mechanics. And above all, he should be led to love, to appreciate the beautiful in nature, that he by such love and appreciation may become beautiful in character.

The coming farmer cannot be truly educated in the district schools of today; but I apprehend that within the next two decades there will be a mighty evolution in his education. We are on the verge of it now. Within the next twenty years

we will see the township system, or even a superior system of schools, headed by teachers possessing agricultural college diplomas as well as normal school certificates. Not until then will the oldest and the noblest occupation on earth reach perfection, when every tiller of the soil will be a broad-minded, cultured, scientific farmer; the result of his right education.

SUCCESS.

MRS. A. D. GILLIES, Cass City, at WOMEN'S SECTION, TUSCOLA COUNTY Institute, Cass City.

It has been said: "To be successful, every man should have a mark in view, and pursue it steadily. He should not be turned from his course by other subjects ever so attractive. Life is not long enough for any one individual to accomplish everything; indeed but few can at best accomplish more than one thing well. Many, alas, very many! accomplish nothing worthy." Yet there is not a man or woman with ordinary intellect or capacity but can accomplish at least one useful, important, worthy purpose.

As man was the noblest work of God, as he came from the hands of his Creator, being only a little lower than the angels, it is his duty to count his talents and find in what direction they will lead him, what calling he could most successfully follow, in what sphere he could accomplish the most good.

All persons have certain elements by which they are naturally adapted to pursue certain callings, and their success in life will depend on their following along on this line. Our country abounds with men and women possessing sufficient natural talent to fill with credit the position that nature adapted them for, if they will pursue it to the exclusion of all others. Man's days at most are so few, and his capacity, at the highest, so small, that never yet has he even by confining the united efforts and energies of his lifetime at the most trivial pursuit, attained to perfection; and he never will. How much less, then, are the probabilities of his exhausting several. It requires industry, purpose, will and oneness of aim to succeed, and progress is altogether impossible without it. One writer says that "The idle pass through life leaving as little trace of their existence as foam upon the water, or smoke upon the air; whereas the industrious stamp their character upon their age, and influence not only their own, but all succeeding generations."

If we are wise we will diligently apply ourselves, for labor is, and ever will be, the price set upon everything which is valuable.

In reading the lives of eminent men who have greatly distinguished themselves, we often find they come from the most humble homes; that whatever may have been their talents they did not attain their ultimate success without the most arduous, well directed labor for self improvement.

It is astonishing what may be accomplished in self culture by the energetic and the persevering, who are careful to avail themselves of opportunities, and use up the fragments of spare time which the idle permit to run to waste.

No matter in what position you are placed, industry and determination are the great things. We must not only "Strike while the iron is hot," but strike it until it is made hot. A busy life is usually a cheerful one. Persons with active minds are seldom gloomy. Frances Osgood has embodied a world of truth in her beautiful poem on "Labor."

"Labor is life; 'tis the still water faileth;
Idleness ever despaireth, bewaileth
Keep the watch wound, for the dark rust assaileth;
Flowers droop and die in the stillness of noon.
Labor is glory! The flying cloud lightens;
Only the waving wind changes and brightens;
Idle hearts only the dark future frightens;
Play the sweet keys wouldst thou keep them in tune."

I would urge upon the thought of all that the lowliest tasks may be more important in themselves and in their relation to other events than we have ever dreamed.

None of us know how boundless in its usefulness and in its influences for good our commonest work may become. Let us go about our work with shining faces. God will take our small resources, and will multiply them beyond our dreams.

Let us scatter the seeds He has given us to sow, remembering that success in life consists in the proper and harmonious development of those faculties which God has given us.

HEALTH, HOME AND HAPPINESS.

MRS. E. F. SAWYER, Manton, at WOMEN'S SECTION, WEXFORD COUNTY Institute, Cadillac.

"Among a man's duties, care of the body is imperative, not only out of regard to personal welfare, but also out of regard to his descendants."—Herbert Spencer.

In studying the needs of the body, we find the indispensable requirements to be proper clothing, proper food, proper exercise, proper rest, proper diversion and proper sleep. Such conditions, if carefully fulfilled, would save many doctor's bills. "Ill health makes men cross and women irritable; disease undermines the judgment and gives the tongue and body undue haste of word and deed. No habit grows so fast as irritability. Remove the cause of disease and it disappears; remove the cause of irritability and that too will disappear."

If then our food affects our health, and our health affects our disposition, what shall we eat that we may be sound in body and mind?

Fortunately for busy housewives, it is the plainest food, that easiest prepared, which is the most healthful. Fancy cooking or fancy dishes are not necessary, though variety is. It is really sorrowful that so few housewives appreciate the value of bread made from whole wheat flour. Why should the most valuable, the most nutritious, part of the grain be fed to the stock?

While it is conceded to be necessary that live stock receive a proper portion of protein in their food, we seem to act upon the principle that the human body can be kept in health and strength by any kind of food which pleases the taste, no matter what proportion of life-sustaining properties it contains—or lacks.

It is a wonderful fact that in the composition of a grain of wheat, we find all the elements of the body in exactly the proportions required. The outer shell contains the muscle making food—this is thrown out in white flour and the white center retained, which supplies only heat and fat and is almost useless for creating muscle and brain.

While wheat bread is the best, the most nutritious food for daily use known, and it has been proved that it alone will sustain life indefinitely, while white bread can scarcely keep one alive two months, unless other food is used with it. White bread, butter and sugar, as well as potatoes, are all heat producers and contain but little else; and if these be the only diet, the blood becomes impoverished, and inflammation, headache, fevers and neuralgic pains follow, so that in spite of the pure air, pure water and fresh vegetables to be had on the farm, the digestive organs of the farmer and his family are liable to be taxed to the utmost. As for fried potatoes, ham, salt pork, white bread, cakes and pies, though agreeable to the taste, they are not the most wholesome food and are very hard to digest, especially for children and those of weak constitutions. But by substituting whole wheat bread—"Flouright" is a good brand—which is as easily prepared as white bread, when well made and eaten with good butter and honey and a glass of millk, hot or cold, constitutes a perfect meal, while if used with lean meat, eggs, cheese, apples, pears, peaches, grapes or blackberries fresh or canned, would prove an ideal meal for old or young.

While the health and comfort of the entire household should be duly considered, it is absolutely imperative that the young and growing bodies of our children shall have every opportunity to develop into strong and healthy men and women.

Every farmer knows in regard to his live stock that if the young, the growing animals are neglected, abused, ill sheltered or poorly fed, or if their food lacks the proper proportion of protein, he need not expect them to develop into the best of their kind. So, likewise, if our children appear to be slight and weak in body and mind, we may well lay it to the food they eat and not to their mental capacity for hard work. Not only should our children be sensibly clothed and hygienically fed, but in order to attain to sound mental and physical faculties it is necessary to provide healthful and proper diversion or amusements, for we must always bear in mind "That all work and no play makes Jack a dull boy," and that the same

thing makes his sister an equally dull girl. This maxim will apply to grown up boys and girls, long after marriage too, and our farmers and their wives should early learn that it does not pay to work themselves to death simply to lay up a few dollars for the next generation.

SUCCESSFUL BEE CULTURE.

GEO. BLUE, Manton, at WEXFORD COUNTY Institute, Cadillac.

The first thing requisite to successful bee culture is strong colonies. Now, the question is, How do you make strong colonies?

In this question are three very important points: In fact success or failure depends upon them. The first is the condition of the bees preparatory to winter quartering; second, the wintering; third, the spring.

To put the colony in condition for winter, it must be known and made sure of that the bees gather honey until late in the season, in order to stimulate late brooding. Should there be a dearth of honey flowers in August and September, although the hives may be full of honey, the bees must be fed with honey or sugar syrup, so that they will be able to begin winter with a hive full of young bees. Should there be no young bees after August or September, I will assure you there will be no live bees in the spring, for they will all die of old age, even though they have been ever so strong in the fall.

Now as to wintering there are many different ideas. But my idea is this: Have a good warm, dry cellar, not a cellar under some building where there is a continual jar and noise to disturb the bees, but a good outdoor cellar where they are not molested from fall until spring. And by the way, this cellar should be made early in the summer, and the door and ventilator should be left open, so as to allow the cellar to become thoroughly dry before winter or before the bees are moved into it, which is usually about the first of December. The experience of the past winter will in a large degree prove my theory of cellar wintering a success, for we lose no bees in our cellar.

The hives are placed in the cellar in tiers, three or four deep, with covers removed so as to leave a space of about an inch for ventilation, and the work is complete, with the exception of a good mouse trap or a small dish of meal or flour in which a little strychnine has been sprinkled in case there should be mice.

In spring the bees should be removed from the cellar, as soon as the snow is gone and the thermometer registers fifty or more above, and placed on the summer stands.

Then stimulate early brooding by feeding, as before stated, and by the time the honey flow comes the bees are strong and in condition, with our modern improvements and with no negligence on the part of the apiarist to make bee culture a success.

GENERAL REPORT OF INSTITUTE WORK.

PRESIDENTS AND SECRETARIES OF COUNTY INSTITUTE SOCIETIES FOR 1898-9.

Counties.	President.	Address.	Secretary.	Address.
Alcona	Geo Rutson	Harrisville	L. A. Colwell	Harrisville.
Alger [1]				
Allegan	T. G. Adams	Shelbyville	C. E. Bassett	Fennville.
Alpena	E. O. Avery	Alpena	E. H. Toland	Ossineke.
Antrim	Wm. E. Hickox	Bellaire	C. E. Densmore	Bellaire.
Arenac	Thomas Turner	Maple Ridge	E. G. Cole	AuGres.
Baraga [1]				
Barry	J. J. Perkins	Prairieville	James M. Bauer	Hastings.
Bay	L. W. Oviatt	Auburn	F. W. Dunham	W. Bay City.
Benzie	C. B. Canniff	Benzonia	R. B. Reynolds	Frankfort.
Berrien	W. H. Seitz	Royalton	A. N. Woodruff	Watervliet.
Branch	A. L. Smith	Girard	A. L. Bowen	Quincy.
Calhoun	Marshal Starr	Marshall	W. A. Powell	Marshall.
Cass	James W. Springsteen	Dowagiac	Wm. VanNess	Edwardsburg.
Charlevoix	M. M. Burnham	East Jordan	E. B. Ward	Charlevoix.
Cheboygan	P. L. LaPres	Cheboygan	Q. C. Ball	Mullet Lake.
Chippewa	E. C. Davidson	Rudyard	T. R. Easterday	S'lt Ste. Marie.
Clare				
Clinton	Geo. A. Ferrey	St. Johns	H. P. Keys	St. Johns.
Crawford	O. Palmer	Grayling	J. J. Coventry	Grayling.
Delta [1]				
Dickinson [1]				
Eaton [2]	Jas. H Gallery	Eaton Rapids	Geo. A. Perry	Charlotte.
Emmet	James L. Morrice	Harbor Springs	Henry S. Babcock	Harbor Spr'gs.
Genesee	S. R. Billings	Davison	John Miller	Swartz Creek.
Gladwin	Frank Leonard	Gladwin	H. R. Clarke	Gladwin.
Gogebic [1]				
Grand Traverse	Robert Barney	Traverse City	E O. Ladd	Traverse City.
Gratiot	Jotham Allen	Ithaca	Otto F. Mey	Forest Hill.
Hillsdale	Elias F. Brown	Reading	Earl H. Dresser	Litchfield.
Houghton [1]				
Huron	Allen Ramsay	Sigel	Mrs. Geo. Pangman	Verona Mills.
Ingham	Harvey Wilson	Mason	L. H. Ives	Mason.
Ionia	Arthur P. Loomis	Ionia	W. W. Bemis	Ionia.
Iosco	J. M. Walker	Tawas City	Len J. Patterson	Tawas City.
Iron	Olaf Helgemo	Iron River	Christ Bernhardt	Beechwood.
Isabella	Wallace W. Preston	Mt. Pleasant	M. E. Kane	Mt. Pleasant.
Jackson	Frank Dwelle	Grass Lake	L. Whitney Watkins	Manchester.
Kalamazoo [1]				
Kalkaska	James Greacen	Kalkaska	E. C. Chesshir	Kalkaska.
Kent	Wm. T. Adams	Grand Rapids	Wm. K. Munson	Grand Rapids.
Keweenaw [1]				
Lake	S. Fradenberg	Chase	G. T. Field	Chase.
Lapeer	W. W. Stickney	Lapeer	G. W. Carpenter	Lapeer.
Leelanau [1]				

PRESIDENTS AND SECRETARIES OF COUNTY INSTITUTE SOCIETIES.—CONCLUDED.

Counties.	President.	Address.	Secretary.	Address.
Lenawee	Levi C. Chase	Adrian	A. B. Graham	Sand Creek.
Livingston	Frank R. Crandal	Howell	H. E. Reed	Howell.
Luce [1]				
Mackinac [1]				
Macomb	A. M. Keeler	Richmond	Frank D. Wells	Rochester.
Manistee	J. E. Cody	Bear Lake	J. H. Read	Pomona.
Marquette	Robt. Blemhuber	Marquette		
Mason	John Griffin	Scottville	L. W. Rose	Wesley.
Mecosta	Arnold Ely	Big Rapids	C. F. Kiefer	Borland.
Menominee	Edward Sawbridge	Stephenson	Norwood Bowers	Stephenson.
Midland	Jas. Anderson	Midland	John H. Johnson	Laporte.
Missaukee	John Vanmeter	McBain	D. D. Walton	Lake City.
Monroe	Albert Bond	London	John Nichols	Ida
Montcalm	C. F. French	Lake View	J. H. Jensen	Lake View.
Montmorency [1]				
Muskegon	F. D. Hoogstraat	Ravenna	F. E. Thacher	Ravenna.
Newaygo	J. H. Edwards	Newaygo	W. C. Stuart	Fremont.
Oakland	Jerome G. Noble	Oxford	Jas. Y. Clark	Orion.
Oceana	A. C. Kocher	Shelby	C. F. Hale	Shelby.
Ogemaw	John Regan	West Branch		
Ontonagon	J. E. Crooker	Ontonagon	H. M. Powers	Ontonagon.
Osceola	E. H. Marvin	Reed City	August C. Goehrend	Reed City.
Oscoda	Stewart Gorton	Luzerne	Robt. Kittle	Biggs.
Otsego	Wm. Parmater	Gaylord	R. D. Bailey	Gaylord.
Ottawa	A. G. VanHees	Zeeland	Colon C. Lillie	Coopersville.
Presque Isle [1]				
Roscommon [1]				
Saginaw	R. W. Beeman	Swan Creek	J. A. Slocum	Saginaw, W.S.
Sanilac	Wm. Dawson	Sanilac Center	Henry Ruttle	Carsonville.
Schoolcraft [1]				
Shiawassee	P. B. Reynolds	Owosso	A. B. Cook	Owosso.
St. Clair	C. S. King	Port Huron	Jas. Dunn	Emmett.
St. Joseph	Comfort A. Tyler	Nottawa	G. D. G. Thurston	Sturgis.
Tuscola	N. E. York	Millington	F. A. Bradley	Vassar.
Van Buren	Davis Haven	Hartford	Stephen Doyle	Hartford.
Washtenaw	Wm. Campbell	Ypsilanti	F. E. Mills	Rawsonville.
Wayne	O. P. Gulley	Dearborn	R. Graden	Taylor Center
Wexford	R. C. Norris	Cadillac	Elwood Peck	Cadillac.

[1] Counties not organized May 1, 1899.
[2] County Agricultural Society acting as Institute Society.

LECTURERS AVAILABLE AT FARMERS' INSTITUTES, 1898-9.

WITH TOPICS OF LECTURES.

We present below the names and addresses of persons who were available last year as lecturers for the various Institutes. We have also given the topics of lecturers, thinking such information might be of assistance in the future to secretaries of Institute Societies in requesting topics or speakers, and also in arranging the local programs. We have divided the list of speakers into three classes:

I.

The following are regularly connected with the Agricultural College and received expenses only while attending Institutes:

C. H. Alvord, Foreman of the Farm:
1.—Farm conveniences.
2.—Maintenance of soil fertility.
3.—Growing and feeding the corn crop.

Prof. W. B. Barrows, Professor of Entomology and Zoölogy:
Any topic relating to insect pests.

M. L. Dean, Assistant in Horticulture:
1.—Better fruit for the home.
2.—Potato culture.
3.—Orchard and garden pests.
4.—Small fruit culture.
5.—Vegetables for the home.

H. P. Gladden, Assistant Professor of Horticulture:
1.—The farmer's fruit orchard.
2.—Small fruit culture.
3.—Spraying for fruit diseases.
4.—Laying out and planting the farm door yard.

Miss Maud R. Keller, Dean Women's Department:
1.—The value of training.
2.—Our right of education.

C. E. Marshall, Bacteriologist, Experiment Station:
1.—Farm water supply.
2.—Bacteria in the making of butter.
3.—Bacterial cleanliness.
4.—Economic value of bacteria.
5.—Fermentation (bread, vinegar, silo, etc.).
6.—Bacteria in disease.
7.—Bacterial poisoning of food.
8.—Bacteria in cheese manufacture.

Prof. H. W. Mumford, Assistant Professor of Agriculture:
1.—Sheep feeding.
2.—Wool production.
3.—Selection and breeding of stock.
4.—Any stock feeding topic.
John M. Rankin:
1.—Bee keeping for farmers.
Miss Edith R. Rushmore, Instructor in Domestic Science:
1.—Food. (Eve.)
2.—Value of domestic science instruction. (Eve.)
3.—Chemistry of cooking and cleaning. (Women's Section.)
4.—Demonstration cooking lecture—1 hr. (Women's Section.)
Prof. C. D. Smith, Professor of Agriculture and Director of Experiment Station:
1.—Sugar beets.
2.—Maintenance of soil fertility.
3.—Any dairy topic.
4.—Fattening steers in Michigan.
5.—Lamb feeding.
6.—Pig feeding.
7.—Farm crops.
Dr. J. L. Snyder, President:
1.—Educational topics. (Eve.)
Prof. L. R. Taft, Professor of Horticulture:
Any fruit topic.
J. D. Towar, Agriculturist, Experiment Station:
1.—Rotation of crops.
2.—Wheat.
3.—Wastes and wear on the farm.
4.—Fertilizer farming.
5.—Catch crops and green manuring as means of keeping up soil fertility.
6.—Good roads.
7.—Work of Experiment Stations. (Eve.)
Dr. G. A. Waterman, Professor of Veterinary Science:
1.—Prevention of disease by proper care.
2.—Lamenesses.
3.—Diseases of the dairy cow.
4.—Parturition and diseases incident thereto.
Prof. C. F. Wheeler, Assistant Professor of Botany:
1.—Diseases of plants.
2.—Rusts and smuts.
3.—Weeds.
4.—Grasses and forage plants.

II.

The following were employed especially for Institute work, and were paid a per diem and expenses:

Jotham Allen, Ithaca:
1.—Clover vs. timothy, and crop rotation.
2.—Stock raising and feeding.
3.—Education for the farm. (Eve.)
Wm. Ball, Hamburg:
1.—Selection and care of farm stock.
2.—Keeping up soil fertility.
3.—Business sense in farming.
4.—Clean farming; a talk on weeds.
5.—Up-to-date stock feeding for the general farmer.
6.—Bean growing.
7.—Success in feeding stock.
8.—Value of improved stock, and how to improve it.
9.—How I grow corn.
E. F. Brown, Reading:
1.—Different phases of farming.
2.—Hogs, and how to grow them.

C. B. Charles, Bangor:
1.—Underdraining.
2.—Farm accounts.
3.—Improving and utilizing low lands.
4.—The country school. (Eve.)

I. N. Cowdrey, Ithaca:
1.—Soil fertility and how to maintain it.
2.—Cultivation of crops.
3.—Proper treatment of clover.
4.—Hog growing for profit.
5.—Potato growing.
6.—A garden with small fruit.
7.—Corn growing.

E. A. Croman, Grass Lake:
1.—How I handle worn out land.
2.—The creamery.
3.—The swine herd.
4.—Corn culture.
5.—Clovers and grasses.
6.—Selection and breeding of improved stock.
7.—Root crops for stock.

J. T. Daniells, Union Home:
1.—Farm wastes vs. farm economies.
2.—Possibilities of farm life. (Eve.)

M. W. Fulton, Highland Park:
1.—A talk on cultivation.
2.—Soil fertility.
3.—Farm fencing.

Robt. Gibbons, Detroit:
1.—Marketing farm products.
2.—Improved stock for farmers.
3.—The farmer as a business man.

C. P. Goodrich, Ft. Atkinson, Wis.:
1.—The profitable cow.
2.—Feeds and feeding for dairy cows.
3.—Silos and silage.
4.—The rotation of crops.
5.—Manure value of different foods.
6.—A talk to young farmers. (Eve.)
7.—The making and selling of butter.
8.—Corn culture.
9.—The selection, feeding and care of a small dairy herd.
10.—Making and marketing butter.
11.—The best method of caring for and using corn fodder.
12.—Maintaining fertility.
13.—Drainage.

A. P. Gray, Archie:
1.—Essentials of profitable apple growing.
2.—Small fruits for market.
3.—Fruit growing in northern Michigan.
4.—Origin and preservation of fertility.
5.—"Growth" as applied to the animals, crops, and business of the farm. (Eve.)

H. H. Hinds, Stanton:
1.—Live stock sanitation.
2.—The importance of mixed farming.

J. W. Hutchins, Hanover:
1.—Everyday dairying for everyday farmers.
2.—Tillage.
3.—Maintaining soil fertility.
4.—Maintaining mental fertility. (Eve.)
5.—A man among men. (Eve.)

Colon C. Lillie, Coopersville:
1.—Keeping up soil fertility.
2.—Increasing soil fertility, or bringing up a run-down farm.
3.—Up-to-date stock feeding and management.
4.—The co-operative creamery vs. the home dairy.
5.—Selection, breeding, and care of the dairy herd.
6.—Advantages of winter dairying.
7.—Advantages of the silo; how to build one.
8.—Growing, handling, and feeding ensilage.
9.—Dairying as a business.
10.—Pig raising as an adjunct of dairying.
11.—Clover on the dairy farm; how to handle it.
12.—How to make a profit with farm poultry.
13.—What kind of an education does the farmer need and where can be get it? (Eve.)
14.—Thoroughness in farming.

Roland Morrill, Benton Harbor:
1.—Cultivation and pruning; results illustrated.
2.—Gathering, packing, and marketing fruit.
3.—Business methods in farming.
4.—The successful culture of apples and plums.
5.—Spraying; why, how, when?
6.—Small fruits for market.
7.—Peaches and plums.
8.—The home fruit garden.
9.—Benefits of intensive cultivation.
10.—The apple orchard.
11.—Objects and methods of pruning.
12.—Value of commercial fertilizers.
13.—The horticultural situation.

A. E. Palmer, Kalkaska:
1.—The home dairy.
2.—Elements of successful farming in northern Michigan. (Eve.)
3.—The education of the farmer. (Eve.)
4.—Soil fertility; how formed; how preserved.
5.—Value of manures on sandy lands.
6.—Silage and silos.
7.—Summer feeding of dairy cattle.
8.—The development of northern Michigan. (Eve.)
9.—Good roads under the county system.
10.—Green soiling vs. pasturage of dairy stock.
11.—Rotation of crops.
12.—Rye as a cattle food.

L. J. Post, Lowell:
1.—Orcharding.
2.—Spraying.
3.—Potato growing.
4.—Farm management.
5.—Commercial fertilizers.

Jas. Pullar, Sault Ste. Marie:
1.—Bringing up a run-down farm.
2.—Business farming.
3.—Knowing what you are about.

A. G. Randall, Tekonsha:
1.—Condition and wants of our country schools. (Eve.)
2.—Nature study in country schools. (Eve.)
3.—The school problem. (Eve.)
4.—How shall we improve our common schools? (Eve.)
5.—The farm and the school. (Eve.)

F. F. Rogers, Port Huron:
1.—Road improvement.

John L. Shawver, Bellefontaine, Ohio:
1.—Farm buildings.
2.—The farm home. (Eve.)

J. N. Stearns, Kalamazoo:
1.—Pruning, cultivating, fertilizing.
2.—Making a market for fruit.
3.—How shall we grade and pack our fruit?
4.—Spraying and thinning.
5.—Starting right in fruit growing.
6.—Successful orcharding in southern Michigan.
7.—Small fruits on the farm.

Peter Voorheis, Pontiac:
1.—Sheep and wool industry.
2.—Growing fruit and care of orchards.
3.—Diversified farming.
4.—Benefits of Institutes. (Eve.)

A. M. Welch, Ionia:
1.—My experience with building and using silos.
2.—Successful milk production.
3.—Shall we buy or raise our cows?
4.—Economical sheep feeding.
5.—Winter feeding of cows with or without silage.

Jason Woodman, Paw Paw:
1.—Cattle feeding; its prospects and its practice.
2.—Farmers' organizations; their value and how to maintain them. (Eve.)
3.—Building up an exhausted farm.

J. S. Woodward, Lockport, N. Y.:
1.—What ails the orchards, and the remedy.
2.—A lost industry; sheep keeping. Why it ought to be revived.
3.—Winter lamb raising.
4.—Money in pigs.
5.—Chemicals and clovers.
6.—What shall we eat and what shall we drink? (Eve.)
7.—Household conveniences. (Eve.)
8.—Possibilities for the farm boy.

LADY SPEAKERS.

See also Agricultural College List.

Mrs. Emma Campbell, Ypsilanti:
1.—What is best? (Women's Section.)
2.—What does it mean to say, yes? (Eve.)

Mrs. Irma T. Jones, Lansing:
1.—Household sanitation. (Eve.)
2.—The mother's greatest need. (Women's Section.)
3.—Influence of women in social progress. (Eve.)
4.—Mental food, or what shall we read? (Eve.)
5.—Whose image? (Women's Section.)
6.—American womanhood: its perils and its privileges.

Mrs. Mary A. Mayo, Battle Creek:
1.—The house in which we live. (Women's Section.)
2.—How to keep the boys on the farm. (Eve.)
3.—Mother and daughter. (Women's Section.)
4.—Home life on the farm. (Eve.)
5.—The unappreciated side of farm life. (Eve.)
6.—The mother's great need. (Women's Section.)
7.—The mother in her relation to the school. (Women's Section.)

Miss Louise Miller, Detroit:
1.—Nature study in relation to some problems in life. (Women's Section.)
2.—Child study. (Eve.)
3.—Nature study as a basis for the religious training of children. (Eve.)

Mrs. Belle M. Perry, Charlotte:
1.—Consecrated parentage. (Women's Section.)
2.—What shall we do for our children? (Eve.)
3.—What is worth while? (Eve.)

Mrs. Ella E. Rockwood, Flint:
1.—How to be happy on a farm. (Eve.)
2.—A talk with home-makers. (Women's Section.)

III.

The following from various State institutions and departments were available for expenses only:

DR. A. C. LANE, Assistant State Geologist, Houghton:
1.—The occurrence of coal. (Illustrated with stereopticon.)
2.—Best farm water supply.
3.—Geology of Lower Michigan.

FROM THE STATE BOARD OF EDUCATION.

SUPT. JASON E. HAMMOND, Lansing:
1.—Affiliation of country schools with higher educational institutions.
2.—The text-book situation in Michigan.
3.—Better country school houses. (Illustrated with model.)
4.—Higher qualifications for teachers.
5.—School libraries in Michigan.
6.—School equipment.

PROF. CHAS. MCKENNNY, Principal, Central Michigan Normal School, Mt. Pleasant:
1.—The future of our rural schools.
2.—Determining factors in life.
3.—Some laws of mind growth in children.
4.—The moral training of chidren.
5.—The mission of America.

HON. PERRY F. POWERS, Cadillac:
1.—The school and the home.
2.—Education and citizenship.

FROM STATE BOARD OF CORRECTIONS AND CHARITIES.

L. C. STORRS, Secretary, Lansing:
1.—Our prison system.
2.—The State's children.
3.—District poor houses vs. county poor houses.

FROM STATE BOARD OF HEALTH.

PRESIDENT FRANK WELLS, Lansing:
1.—Hygiene for the farm home.

JUDGE A. V. MCALVAY, Manistee:
Any sanitary topic.

DR. F. R. BELKNAP, Niles:
1.—The farmer's health, the farmer's wealth.
2.—Healthy homes for farmers.
3.—How to deal with the dangerous communicable diseases.

DR. S. G. MILNER, Grand Rapids:
1.—Hygiene for the homestead.

SECRETARY HENRY B. BAKER, Lansing:
1.—How can we prevent or avoid the most dangerous diseases?
2.—How to ventilate and warm a house.

FROM UNIVERSITY OF MICHIGAN.

PROF. HENRY C. ADAMS, Professor of Political Economy and Finance.
1.—Local taxation.

PROF. H. S. CARHART, Professor of Physics.
1.—Lightning rods, and how to make them.

PROF. J. B. DAVIS, Professor of Geodesy and Surveying:
1.—Good roads.

PROF. B. A. HINSDALE, Professor of the Science and the Art of Teaching.
1.—The Michigan system of public instruction.

DR. W. B. HINSDALE, Professor of Theory and Practice of Medicine, and Clinical Medicine:
1.—Practical farm sanitation.
2.—The adulteration of food and farm products.

JUDGE V. H. LANE, Fletcher Professor of Law:
1.—The habitual criminal.
PROF. F. C. NEWCOMB, Junior Professor of Botany:
1.—The first principles of agriculture.
DR. F. G. NOVY, Junior Professor of Hygiene and Physiological Chemistry:
1.—Bacterial diseases of plants and animals.
PROF. I. C. RUSSELL, Professor of Geology:
1.—Geographical history of the Great Lakes.
(Illustrated with stereopticon.)
PROF. B. M. THOMPSON, Jay Professor of Law:
1.—Early English community farming.
PROF. JACOB REIGHARD, Professor of Zoölogy:
1.—Trichina—The flesh worm of pork.
(Evening lecture, illustrated with stereopticon.)

COUNTY FARMERS' INSTITUTES, 1898–9.

WITH DATES AND ATTENDANCE.

[Attendance reported by conductors. Includes women's sections.]

County.	Place.	Date.	Attendance.						Total.	Average per session.
			First day.			Second day.				
			A. M.	P. M.	Eve.	A. M	P. M.	Eve.		
Alcona	Harrisville	Jan. 18-19, 1899	56	121	112	63	212	350	914	152
Allegan	Fennville	Feb. 22-24, 1899.	80 †125	175 215	110	110	175	125	1,115	139
Alpena	Long Rapids	Jan. 17-18, 1899	.....	34	96	26	89	.....	245	61
Antrim	Bellaire	Jan. 20-21, 1899	50	80	180	82	164	240	796	133
Arenac	Au Gres	Jan. 20-21, 1899	.....	48	72	46	96	.....	262	65
‡Baraga	Baraga	Dec. 5, 1898	24	60	.....	.....	.....	.....	84	42
Barry	Middleville	Feb. 22-24, 1899.	80 †90	130 240	175	90	220	250	1,275	159
Bay	Bay City	Jan. 23-25, 1899.	..... †58	57 85	22	53	156	43	474	68
Benzie	Inland	Jan. 17-18, 1899	27	45	51	45	80	87	335	56
Berrien	Berrien Springs	Feb. 8-9, 1899	46	166	88	44	88	53	485	81
Branch	Quincy	Feb. 14-15, 1899	242	455	325	301	500	520	2,343	390
Calhoun	Marshall	Feb. 16-18, 1899.	..... †125	75 180	135	130	325	250	1,220	174
Cass	Edwardsburg	Feb. 9-10, 1899	.....	45	67	135	196	182	625	125
Charlevoix	Boyne City	Jan. 24-25, 1899	46	67	180	80	130	230	733	122
Cheboygan	Cheboygan	Dec. 8-9, 1898	18	51	84	49	101	223	526	88
Chippewa	Sault Ste. Marie	Dec. 7-8, 1898	27	66	42	33	40	.....	208	42
‡Clare	Clare	Dec. 7, 1898	100	250	500	.....	.....	.....	850	283
Clinton	St. Johns	Feb. 2-3, 1899	69	132	52	119	227	.....	599	119
Crawford	Grayling	Dec. 15-16, 1898	.....	91	81	.....	29	.....	201	67
‡Delta	Escanaba	Dec. 2, 1898	.....	15	.....	.....	.....	.....	15	15
Eaton	Olivet	Feb. 10-11, 1899	.....	111	103	111	325	235	885	177
Emmet	Harbor Springs	Jan. 23-24, 1899	93	113	106	131	242	183	868	144
Genesee	Clio	Feb. 1 2, 1899	139	550	580	325	600	650	2,644	440
Gladwin	Gladwin	Dec. 8-9, 1898	.....	55	195	90	200	300	840	168
G'd Traverse	Traverse City	Jan. 18-20, 1899.	..... †117	123 171	81	143	233	212	1,140	163
Gratiot	Alma	Jan. 31, Feb. 1-2, 1899	..... †125	225 280	100	135	385	450	1,700	243
Hillsdale	Hillsdale	Feb. 14-16, 1899.	..... †85	58 102	22	88	152	54	561	80
‡Houghton	Lake Linden	Dec. 6, 1898	105	75	90	.....	.....	.....	270	90
Huron	Sand Beach	Jan. 23-25, 1899.	..... †231	210 625	550	257	436	700	3,009	429
Ingham	Williamston	Feb. 9-10, 1899	62	109	70	68	228	168	765	117
Ionia	Portland	Feb. 8-9, 1899	62	175	140	73	165	125	740	123
Iosco	Tawas City	Jan. 19-20, 1899	29	71	126	70	180	177	653	109
Iron	Iron River	Nov. 30, Dec. 1, '98	8	20	150	9	30	.....	217	43
Isabella	Shepherd	Jan. 30-31, Feb. 1, 1899	..... †75	40 100	75	70	178	220	758	108

† Third day.
‡ County one-day institutes.

County Farmers' Institutes, 1898-9.—Concluded.

County.	Place.	Date.	Attendance.						Total.	Average per session.
			First day.			Second day.				
			A. M.	P. M.	Eve.	A. M.	P. M.	Eve.		
Jackson	Grass Lake	Feb. 16-17, 1899	135	405	550	350	400	500	2,340	390
Kalkaska	Kalkaska	Jan. 26-27, 1899	24	37	19	33	77	85	275	46
Kent	Rockford	Feb. 10-11, 1899	.....	150	50	160	319	235	914	183
Lake	Chase	Dec. 16-17, 1898	41	45	171	52	68	176	553	92
Lapeer	Lapeer	Jan. 31, Feb. 1, 1899	92	348	143	219	485	292	1,579	263
‡Leelanau	Leland	Jan. 19, 1899	20	40	60	.....	.....	.....	120	40
Lenawee	Adrian	Feb. 16-17, 1899	201	648	325	269	375	86	1,904	317
Livingston	Howell	Feb. 3-4, 1899	115	415	300	375	675	575	2,455	409
Luce			.....	.....	.....	.....	.....	.....	.....	.....
Mackinac			.....	.....	.....	.....	.....	.....	.....	.....
Macomb	Richmond	Jan. 25-27, 1899	.....	97	305	106	245	395	1,423	203
			†105	170	.....	.....	.....	.....		
Manistee	Bear Lake	Dec. 20-22, 1898	.....	90	265	186	282	430	1,586	227
			†162	171	.....	.....	.....	.....		
Mason	Scottville	Dec. 19-21, 1898	.....	51	14	54	155	193	621	88
			†56	98	.....	.....	.....	.....		
Mecosta	Remus	Feb. 2-3, 1899	39	131	230	78	146	275	899	149
Menominee	Stephenson	Nov. 29-30, 1898	18	45	100	40	168	170	541	90
Midland	Laporte	Dec. 6-7, 1898	.....	95	250	45	175	200	765	153
Missaukee	McBain	Dec. 14-15, 1898	.....	54	71	12	45	81	263	53
Monroe	Carleton	Feb. 17-18, 1899	200	360	475	200	500	.....	1,735	347
Montcalm	Lakeview	Feb. 21-22, 1899	100	300	275	200	365	200	1,440	240
‡Montm'ency	Hillman	Jan. 17, 1899	.....	34	.....	.....	.....	.....	34	34
Muskegon	Ravenna	Feb. 8-9, 1899	78	148	256	74	161	200	917	153
Newaygo	Newaygo	Dec. 22-23, 1898	76	123	156	66	75	.....	496	99
*Oakland	Pontiac	Mar 1-3, 1899	265	581	627	380	956	842	5,818	646
			†350	667	1,150	.....	.....	.....		
Oceana	Shelby	Feb. 7-8, 1899	80	200	180	150	350	235	1,195	197
Ogemaw			.....	.....	.....	.....	30	.....	30	30
Ontonagon	Ontonagon	Dec. 2-3, 1898	.....	30	70	25	78	.....	203	51
Osceola	Reed City	Dec. 15-16, 1898	42	157	107	102	128	132	668	111
Oscoda	Mio	Dec. 13-14, 1898	41	156	139	43	95	142	616	104
Otsego	Elmira	Jan. 25-26, 1899	62	118	128	113	198	142	761	127
Ottawa	Coopersville	Feb. 9-10, 1899	32	77	162	87	206	450	1,014	169
‡Presque Isle	Onaway	Jan. 17, 1899	.....	45	95	.....	.....	.....	140	70
Roscommon			.....	.....	.....	.....	.....	.....	.....	.....
Saginaw	Saginaw	Jan. 25-26, 1899	56	118	85	129	132	30	550	91
Sanilac	Sanilac Center	Jan. 24-25, 1899	29	78	150	55	132	300	744	124
‡Schoolcraft	Manistique	Dec. 3, 1898	40	218	.....	.....	.....	.....	258	129
Shiawassee	Vernon	Feb. 7-8, 1899	132	300	310	212	454	347	1,755	292
St. Clair	Capac	Jan. 26-28, 1899	.....	65	78	124	313	276	1,226	175
			†150	220	.....	.....	.....	.....		
St. Joseph	Centerville	Feb. 9-11, 1899	.....	26	45	20	228	207	736	105
			†50	160	.....	.....	.....	.....		
Tuscola	Cass City	Jan. 26-27, 1899	77	243	303	162	276	455	1,516	253
Van Buren	Hartford	Feb. 7-8, 1899	125	470	190	191	208	82	1,266	211
Washtenaw	Ann Arbor	Feb. 15-16, 1899	120	185	200	150	120	120	995	166
Wayne	Dearborn	Feb. 14-15, 1899	70	165	270	170	225	300	1,200	200
Wexford	Cadillac	Dec 13-14, 1898	.....	90	85	46	44	42	297	59
Totals			3,663	11,036	11,999	7,654	15,121	14,232	70,143	11,701
Averages			77	151	173	118	229	254	948	158

* State Round-up. † Third day. ‡ County one-day institutes.

Third Day Attendance.

	A. M.	P. M.	Eve.
Totals	1,904	3,484	1,150
Average	127	232	1,150

LIST OF STATE SPEAKERS ATTENDING COUNTY INSTITUTES, 1898–9.

The first named acted as conductor of the Institute.

County.	Place.	State speakers.
Alcona	Harrisville	Croman, Cowdrey, Towar, Mrs. Rockwood.
Allegan	Fennville	Special Fruit Institute.
Alpena	Long Rapids	Charles, Cowdrey, Mrs. Rockwood.
Antrim	Bellaire	Woodman, E. F. Brown, Palmer, Mrs. Mayo.
Arenac	AuGres	Croman, Cowdrey, Towar.
Baraga	Baraga	Mumford.
Barry	Middleville	Special Dairy Institute.
Bay	Bay City	Charles, Ball, Smith, Gibbons, Towar, Adams, Mrs. Rockwood.
Benzie	Inland	Woodman, Palmer, E. F. Brown, Mrs. Mayo.
Berrien	Berrien Springs	Towar, Hinds, Powers, Smith, Woodward, Mrs. Rockwood.
Branch	Quincy	Woodman, Smith, Snyder, Woodward, Baker, Mrs. Jones.
Calhoun	Marshall	Hutchins, Snyder, Thompson, Smith, Goodrich, Miss Rushmore.
Cass	Edwardsburg	Morrill, Hinds, Powers, Smith, Woodward.
Charlevoix	Boyne City	Woodman, Gray, Alvord, Mrs. Mayo.
Cheboygan	Cheboygan	Mumford, Stearns, Palmer, Mrs. Rockwood.
Chippewa	Sault Ste. Marie	Hutchins, Stearns, Palmer, Mrs. Rockwood.
Clare	Clare	Wm. Ball.
Clinton	St. Johns	Charles, Woodward, Wells, Smith, Hammond, Miss Keller.
Crawford	Grayling	Gladden, Ball, Waterman, Mrs. Jones.
Delta	Escanaba	Palmer.
Eaton	Olivet	Woodman, Voorheis, Snyder, Croman, Miss Rushmore.
Emmet	Harbor Springs	Palmer, Allen, Alvord, Mrs. Mayo.
Genesee	Clio	Croman, Woodward, Rogers, Hammond, Miss Rushmore.
Gladwin	Gladwin	Post, Ball, Hammond, Shawver, Mrs. Jones.
Grand Traverse	Traverse City	Palmer, Powers, E. F. Brown, Allen, Mrs. Mayo.
Gratiot	Alma	Woodman, Storrs, Goodrich, Carhart, Towar, Mrs. Mayo.
Hillsdale	Hillsdale	Morrill, Woodward, Baker, Lillie, Mrs. Jones.
Houghton	Lake Linden	Mumford.
Huron	Sand Beach	Croman, Woodward, Wells, Voorheis, McClure. Mrs. Jones.
Ingham	Williamston	Charles, Voorheis, Storrs, Daniells, Russell, Mrs. Jones.
Ionia	Portland	Woodman, Woodward, Daniells, Reighard.
Iosco	Tawas City	Charles, Cowdrey, Towar, Mrs. Rockwood.
Iron	Iron River	Mumford, Stearns, Croman, Mrs. Rockwood.
Isabella	Shepherd	Hutchins, Goodrich, Carhart, Towar, Mrs. Mayo.
Jackson	Grass Lake	Stearns, Lillie, Judge Lane, Goodrich, Wells, Miss Rushmore.
Kalkaska	Kalkaska	Woodman, Gray, Powers, Alvord, Mrs. Mayo.
Kent	Rockford	Stearns, Allen, Goodrich, Mrs. Mayo.
Lake	Chase	Charles, Shawver, Morrill, Croman, Mrs. Rockwood.
Lapeer	Lapeer	Charles, Woodward, Gibbons, Rogers, Hammond, Mrs. Perry.
Leelanau	Leland	Allen.
Lenawee	Adrian	Woodman, Woodward, Lillie, Novy, Mrs. Jones.
Livingston	Howell	Croman, Woodward, Rogers, Storrs, Hammond, Miss Rushmore.
Macomb	Richmond	Post, Woodward, Baker, McClure, Voorheis, Mrs. Jones.
Manistee	Bear Lake	Croman, Shawver, Morrill, Hammond, Smith, Mrs. Mayo.
Mason	Scottville	Charles, Shawver, Morrill, Hammond, Smith, Mrs. Mayo.

LIST OF STATE SPEAKERS.—CONCLUDED.

County.	Place.	State speakers.
Mecosta	Remus	Hutchins, Goodrich, Towar, Mrs. Mayo.
Menominee	Stephenson	Hutchins, Stearns, Croman, Mrs. Rockwood.
Midland	Laporte	Dean, Ball, Hammond, Shawver.
Missaukee	McBain	Charles, Shawver, Morrill, Barrows, Mrs. Rockwood.
Monroe	Carleton	Ball, Woodward, Judge Lane, Lillie, Mrs. Jones.
Montcalm	Lakeview	Ball, Goodrich, Cowdrey.
Montmorency	Hillman	Croman.
Muskegon	Ravenna	Dean, Goodrich, Reighard, Allen, Randall, Mrs. Mayo.
Newaygo	Newaygo	Morrill, Shawver, Hammond, Smith, Mrs. Mayo.
Oakland	Pontiac	State Round-up.
Oceana	Shelby	Stearns, Allen, Goodrich, Randall, Mrs. Mayo.
Ogemaw	West Branch	No preparation. Institute a failure.
Ontonagon	Ontonagon	Hutchins, Stearns, Croman, Mrs. Rockwood
Osceola	Reed City	Croman, Shawver, Morrill, Barrows, Mrs. Rockwood.
Oscoda	Mio	Post, Ball, Waterman, Mrs. Jones.
Otsego	Elmira	Palmer, Gray, Alvord, Mrs. Mayo.
Ottawa	Coopersville	Croman, Newcombe, Goodrich, Randall, Mrs. Mayo.
Presque Isle	Onaway	Towar.
Saginaw	Saginaw	Smith, Adams, Woodward, Snyder, Mrs. Rockwood.
Sanilac	Sanilac Center	Hutchins, Woodward, Voorheis, McClure, Mrs. Jones.
Schoolcraft	Manistique	Palmer.
Shiawassee	Vernon	Charles, Woodward, Daniells, W. B. Hinsdale, Mrs. Perry.
St. Clair	Capac	Hutchins, Voorheis, Woodward, McCure, Rankin, Mrs. Jones.
St Joseph	Centerville	Hutchins, Hinds, Powers, Smith, Woodward.
Tuscola	Cass City	Charles, Towar, Smith, Snyder, Mrs. Rockwood.
Van Buren	Hartford	Morrill, Goodrich, Powers, Smith, Belknap, Mrs. Rockwood.
Washtenaw	Ann Arbor	Smith, Goodrich, Waterman, Snyder, Miss Keller.
Wayne	Dearborn	Ball, Goodrich, Stearns, Fulton, W. B. Hinsdale, Miss Keller.
Wexford	Cadillac	Croman, Shawver, Morrill, Barrows, Mrs. Rockwood.

ONE-DAY FARMERS' INSTITUTES.

COUNTY ONE-DAY INSTITUTES.

Eight One-day Institutes were held in as many counties which have not organized Institute Societies under the law. Reports from these will be found under the head of County Institutes.

SUMMER ONE-DAY INSTITUTES.

We tried again, during the summer of 1898, the plan of holding a few One-day Summer Institutes. The following were held:

County.	Place.	Date.	State speaker.	Attendance.				
				A. M.	P. M.	Total.	Highest.	Av. per session.
Alcona	Harrisville	Aug. 3	C. D. Smith	23	48	71	48	36
Alpena	Long Rapids	" 2	" "	87	200	287	200	144
Calhoun	Lyon Lake	" 2	W. J Beal	400	500	900	500	450
Eaton	Charlotte	" 11	H. W. Mumford	------	150	150	150	150
Emmet	Bay View	" 16	A. E. Palmer	------	375	375	375	375
Gratiot	Ithaca	" 12	W. J. Beal	96	133	229	133	115
Iosco	Whittemore	" 4	C. D. Smith	70	125	195	125	98
Isabella	----------	" 11	W. J Beal	450	550	1,000	550	500
Kalkaska	Kalkaska	" 3	M. W. Fulton	------	50	50	50	50
Lenawee	Adrian	June 8	L. R. Taft	40	60	100	60	50
Lenawee	Wheatland Tp.	" 9	" "	125	160	285	160	143
Manistee	Arcada	Aug. 3	" "	75	200	275	200	138
Mecosta	Borland	" 5	" "	225	500	725	500	363
Monroe	Ida	June 7	" "	150	250	400	250	200
Newaygo	Fremont	Aug. 4	" "	60	85	145	85	73
Oakland	Orion	" 12	C. D. Smith	240	1,300	1,540	1,300	770
Osceola and Lake	Reed City	" 6	L. R. Taft	500	100	1,500	1,000	750
Ottawa	Riverside Park	" 2	G. H. True	250	275	525	275	263
Sanilac	Sanilac Center	" 10	C. D. Smith	------	35	35	35	35
St. Joseph	Findley	" 10	H. W. Mumford	125	250	375	250	188
Tuscola	Vassar	" 12	" "	------	350	350	350	350
Van Buren	Glendale	" 4	G. H. True	------	200	200	200	200
Wayne	Wayne	" 13	" "	100	300	400	300	200
Totals				3,016	7,096	10,112	7,096	5,642
Average				177	308	439	308	245

WINTER ONE-DAY INSTITUTES.

Eighty-five winter One-day Institutes were held in 24 counties during 1898-9. Fourteen of these, held in the counties of Hillsdale, Huron, St. Clair, and Van Buren, were called "supplementary" Institutes, as the County Institute Societies of those counties paid the per diem and expenses of the State speakers. Thus a total of 68 County or Two-day Institutes, and 115 One-day Institutes, besides the State Round-up were held during the year.

All that we said in last year's report regarding the value and place of One-day Institutes we can reiterate here. There is room in Michigan for 200 to 250 One-day Institutes each winter.

List of Winter One-Day Institutes for 1898-9.

(Attendance reported by State speaker.)

County.	State speaker.	Places.	Dates.	Local managers.	Attendance per session.			Total.	Average per session.
					A. M.	P. M.	Eve.		
Allegan	E. A. Croman	Martin	January 3	L. Bender, Martin		63	153	216	108
		Wayland	" 4	W. H. Smith, Wayland	93	133	148	374	158
		Corning	" 5	A. C. Jones, Middleville	59	78		137	68
		Dorr	" 6	S. S. Felton, Dorr	84	150	155	389	129
		Burnips Corners	" 7	L. P. Heasley, Burnips Corners	78	125		203	101
For county								1,319	109
Barry	C. B. Charles	Woodland	December 6	B. S. Holley, Woodland	96	165		261	130
		Nashville	" 7	Hibbard Offly, Nashville	52	167	138	357	119
		Lacey	" 8	Chas. S. Bristol, Dowling	93	196	219	508	169
		Prairieville	" 9	J. J. Perkins, Prairieville	51	106	160	317	105
For county								1,443	131
Branch	Colon C. Lillie	Girard	January 17	A. L. Smith, Girard	100	225	275	600	200
		Sherwood	" 18	J. D. Dunks, Union City	98	200	200	498	166
		Bronson	" 19	R. Coward, Bronson	102	500		602	301
		Kinderhook	" 20	L. J. Gripman, Kinderhook	125	188	175	488	162
For county								2,188	199
Cass	I. N. Cowdrey	Pokagon	December 15	C. L. Taylor, Pokagon	81	128	78	287	96
		Jones	" 16	D. H Pound, Corey	53	118	169	340	113
For county								627	104

Clinton	J. D. Towar	Maple Rapids	January	10	J. C. Jewett, Maple Rapids	80	110		190	95
		Elsie	"	11	A. M. Cobb, Elsie	80	155	90	325	108
		Ovid	"	12	J. B Morrison, Ovid	20	175		195	97
		DeWitt	"	13	H. M. Webb, De Witt	60	130		190	95
		Wacousta	"	14	W. Depuy, Grand Ledge	62	145		207	103
For county									1,107	100
Emmet	Jotham Allen	Alanson	January	21	N. M. Kellam	50	90		140	90
For county									140	90
Hillsdale (Supplementary.)	I. N. Cowdrey	Allen	January	24	Whitney Watkins, Allen	90	170	124	384	128
		Camden	"	25	S E. Haughey, South Camden	92	198	210	500	166
		Ransom	"	26	Geo. Burt, Ransom	50	60	28	138	46
		Church	"	27	Mrs. E. D. Nokes, Church	123	159		282	141
For county									1,304	118
Huron (Supplementary.)	J. D. Towar	Canboro	January	3	Hector McDermott, Rescue	60	160	150	370	123
		Pinnebog	"	4	Robert McAllister, Pt. Crescent	30	125	90	245	81
		Pt. Austin	"	5	Wm. Somerville, Pt. Austin	32	85		117	58
		Bad Axe	"	6	John Hunt, Verona Mills	87	225	265	577	192
		Ubly	"	7	John Nugent, Wadsworth	25	60	35	120	40
For county									1,429	102
Ionia	A. E. Palmer	Smyrna	December	19	B. F. Tower, Otisco	78	147	45	270	90
		Palo	"	20	Herbert Powell, Ionia	92	193		285	95
		Saranac	"	21	E. H. Hunt, Saranac	153	245	213	611	203
		Orange	"	22	Frank Adgate, Collins	29	38	20	87	29
		Lake Odessa	"	23	Thos. Leake, Lake Odessa	51	137	210	398	132
For county									1,651	118

LIST OF WINTER ONE-DAY INSTITUTES FOR 1898-9.—CONTINUED.

County.	State speaker.	Places.	Dates.	Local managers.	Attendance per session.			Total.	Average per session.
					A. M.	P. M.	Eve.		
Kent	J. D. Towar	Lowell	December 6	L. J. Post, Lowell	40	110		150	75
		Cedar Springs	" 7	Reuben Farnam, Sand Lake	75	110		185	92
		Sparta	" 8	J. A. Symes, Sparta	65	115		180	90
		Caledonia	" 9	J. W. Shisler, Caledonia	80	230		310	105
		Byron Center	" 10	G. Elmer Ewing, Byron Center	75	100		175	87
For county								1,000	100
Lapeer	Colon C. Lillie	North Branch	December 13	Edward Simmons, North Branch	75	200		275	137
		Imlay City	" 14	Robert B. Rice, Imlay City	75	220		295	147
		Metamora	" 15	M. Caley, Metamora	49	175		224	112
		Hadley	" 16	Geo. Davenport, Hadley	110	320		430	215
For county								1,224	153
Leelanau	Jotham Allen	Leland	January 19						
For county									
Lenawee	I. N. Cowdrey	Clinton	January 10	D. Woodward, Clinton	123	320	450	893	297
		Riga	" 11	Jacob Rosenstiel, Riga	76	128	68	272	90
		Morenci	" 12	Albert Deyo, Morenci	209	360		569	284
		Britton	" 13	Wm. Britton, Britton	62	275	304	641	213
		Onsted	" 14	Samuel White, Onsted	90	260	270	620	206
For county								2,995	214
Macomb	A. E. Palmer	Warren	January 10	G. E. Hoard, Warren	106	192	285	583	194
		Utica	" 11	J. S. Lawson, Disco	43	94	92	229	76
		Davis	" 12	Chester Priest, Ray	89	202	257	548	182
		Chesterfield	" 13	Jay Cotton, Milton	61	127	108	296	98
		Mt. Clemens	" 14	Wm. Rosso, Mt. Clemens	27	64	61	152	51
For county								1,808	122

Monroe		Temperance	February 20		85	108		193	96
		Newport	" 21		24	51		75	37
For county								268	67
Oceana	L. J. Post	Elbridge	January 17	C. Leak, Elbridge	64	170		234	117
		Cranston	" 18	Geo. C. Myers, Cranston	180	270	135	585	195
For county								819	163
Osceola		Marion	December 13		17	39		56	28
For county								56	28
Ottawa		Zeeland			30	35		85	42
For county								85	42
Saginaw	A. M. Welch	Freeland	December 13	Dr. W. B. Cubbage, Freeland	250	325	450	1,025	341
		Hemlock City	" 14	Philo Thomas, Hemlock City	75	200	300	575	191
		Brant Center	" 15	Windsor Crane, Brant Center	55	150		205	102
		Burt	" 16	Francis McNally, Burt	25	75		100	50
		Frankenmuth	" 17	Lawrence Hubenger, Frankenmuth	30	60		90	45
For county								1,995	166
Sanilac	A. M. Welch	Brown City	January 17	Wesley, Schlichter, Brown City	250	550	500	1,300	433
		Marlette	" 18	Thos. Fitch, Marlette	60	250	150	460	153
		Croswell	" 19	W. J. Roble, Croswell		200		200	200
		Deckerville	" 20	Jas. Cameron, Deckerville		200		200	200
		Pt. Sanilac	" 21	Henry Oldfield, Pt. Sanilac		185		185	185
For county								2,345	261

LIST OF WINTER ONE-DAY INSTITUTES FOR 1898-9.—CONCLUDED.

County.	State speaker.	Places.	Dates.	Local managers.	Attendance per session.			Total.	Average per session.
					A. M.	P. M.	Eve.		
St. Clair (Supplementary.)	C. D. Smith	Adair	December 7	Orville Lindsay, Adair	40	130		170	85
		China	" 8	R. J. Readike, St. Clair	44	136		180	90
		St. Clair Tp.	" 9	John Ruff, St. Clair	136	175		311	155
For county								661	110
Tuscola	Wm. Ball	Unionville	January 17			60		60	60
		Reese	" 18	Clark Baker, Denmark		75	115	190	95
		Millington	" 19	F. E. Rice, Millington	120	225	200	545	181
		Mayville	" 20	Adam Haines, Mayville	60	160	150	370	123
		Caro	" 21	F. H. Orr, Caro		60		60	60
For county								1,225	122
Van Buren (Supplementary.)	J. D. Towar	Kendall	December 13	C. M. Kingsley, Kendall	55	90		145	72
		Keeler	" 14	J. C. Stafford, Keeler	75	140		215	107
For county								360	90
Wayne	Colon C. Lillie	Redford		Eugene Smith, Sand Hill	35	58	30	123	41
		Northville		D. F. Griswold, Northville	25	59		84	42
		Belleville		James J. Savage, Belleville	78	175		253	126
		Flat Rock		Geo. A. Welle, Flat Rock	56	150		206	103
For county								666	74

THE WOMEN'S SECTION.

While the attendance at the various Women's Sections the past year was not quite so large as a year ago, the interest was well sustained, and in practically every case the ladies desire the sections continued. We asked that each Women's Section select a chairman for next year. This was done in most cases, and the list appears with the other officers for the coming year. Forty-seven per cent of the attendance at Women's Sections was women from farms.

WOMEN'S SECTIONS AT FARMERS' INSTITUTES, 1898-9.

County.	Place.	Local Chm. Women's Section and address.	State speaker.	Attendance.	No. farm women.
Alcona	Harrisville	Mrs. L. A. Colwell, Harrisville	Mrs. Rockwood	125	60
Allegan	Fennville				
Alpena	Long Rapids				
Antrim	Bellaire	Mrs. F. E. Turrell Bellaire	Mrs. Mayo	78	39
Arenac	Au Gres	Mrs. G. Ferguson, Au Gres			
Barry	Middleville				
Bay	Bay City	Mrs. S. G. M. Gates, Bay City	Mrs. Rockwood	40	33
Benzie	Inland	Mrs. Alice W. D. Carpenter, Bendon	Mrs. Mayo	37	37
Berrien	Berrien Springs	Mrs. Dr. Royce, Baroda	Mrs. Rockwood	17	7
Branch	Quincy	Mrs. Hiram Horton, Coldwater	Mrs. Jones	225	90
Calhoun	Marshall	Mrs. Chas. Southerland, Stanley	Miss Rushmore	150	
Cass	Edwardsburg	Mrs. K. Shannahan, Edwardsburg			
Charlevoix	Boyne City	Mrs. Van R. Newville, Boyne City	Mrs. Mayo	69	29
Cheboygan	Cheboygan	Mrs. John W. Smith, Cheboygan	Mrs. Rockwood		
Chippewa	Sault Ste. Marie	Mrs. H. C. Morgan, Sault Ste. Marie	Mrs. Rockwood	30	
Clinton	St. Johns	Mrs. Wm. Woodbury, St. Johns	Miss Keller	65	10
Crawford	Grayling	Mrs. L. Fournier, Grayling	Mrs. Jones	65	10
Eaton	Olivet	Mrs. F. H. Gage, Olivet	Miss Rushmore	100	50
Emmet	Harbor Springs	Mrs. E. P. Nelson, Harbor Springs	Mrs. Mayo	127	66
Genesee	Clio	Mrs. Lucy Swift, Flint	Miss Rushmore	200	
Gladwin	Gladwin	Mrs. Kate Borden, Gladwin	Mrs. Jones	85	44
Gd. Traverse	Traverse City	Mrs. E. S. Gray, Archie	Mrs. Mayo	116	58
Gratiot	Alma	Mrs. W. S. Turck, Alma	Mrs. Mayo	145	125
Hillsdale	Hillsdale	Mrs. E. D. Nokes, Church	Mrs. Jones	60	38
Huron	Sand Beach	Mrs. C. S. Nims, Sand Beach	Mrs. Jones	200	65
Ingham	Williamston	Mrs. Jas. E. Webb, Williamston	Mrs. Jones	110	64
Ionia	Portland				
Iosco	Tawas City	Mrs. Thos. Galbraith, Tawas City	Mrs. Rockwood	83	26
Iron	Iron River	Mrs. G. M. Crippen, Iron River	Mrs. Rockwood		
Isabella	Shepherd	Mrs. Alfred Rowlader, Crawford	Mrs. Mayo	80	58
Jackson	Grass Lake	Mrs. Marcus K. Preston, Grass Lake	Miss Rushmore	140	
Kalkaska	Kalkaska	Mrs. May Dean, Kalkaska	Mrs. Mayo	40	28
Kent	Rockford	Mrs. John Berry, Rockford	Mrs. Mayo	169	80
Lake	Chase	Mrs. Spencer Fradenberg, Chase	Mrs. Rockwood	39	23
Lapeer	Lapeer	Anna R. Jones, Lapeer	Mrs. Perry	90	29
Lenawee	Adrian		Mrs. Jones	350	88
Livingston	Howell	Mrs. Spencer Tooley, Howell	Miss Rushmore	200	150
Macomb	Richmond	Mrs. Chas. Stoddard, Lenox	Mrs. Jones	115	42
Manistee	Bear Lake	Mrs. Geo. W. Hopkins, Bear Lake	Mrs. Mayo	94	72
Marquette	Chocolay				

WOMEN'S SECTIONS AT FARMERS' INSTITUTES, 1898-9. - Concluded.

County.	Place.	Local Chm. Women's Section and address.	State speaker.	Attendance.	No. farm women.
Mason	Scottville	Mrs. Grace T. Smith, Ludington	Mrs. Mayo	59	30
Mecosta	Remus	Mrs. A. Amon, Remus	Mrs. Mayo	47	41
Menominee	Stephenson	Mrs. Edw. Sawbridge, Stephenson	Mrs. Rockwood	93	43
Midland	Laporte				
Missaukee	McBain	Mrs. Wm. McBain, McBain	Mrs. Rockwood	37	4
Monroe	Carleton	Mrs. J. J. Lautenschlager, Carleton	Mrs. Jones	60	38
Montcalm	Lakeview				
Montmorency	Hillman				
Muskegon	Ravenna	Mrs. Nellie Knowles, Ravenna	Mrs. Mayo	67	37
Newaygo	Newaygo	Mrs. H. D. Woodward, Newaygo	Mrs. Mayo	39	25
Oakland					
Oceana	Shelby	Mrs. C. F. Hale, Shelby	Mrs. Mayo	125	54
Ogemaw	West Branch				
Ontonagon	Ontonagon	Mrs. L. Stannard, Rockland	Mrs. Jones	26	3
Osceola	Reed City	Mrs. Jas. Dillon, Reed City	Mrs. Rockwood	65	38
Oscoda	Mio	Mrs. Geo. Richardson, Mio	Mrs. Jones	64	41
Otsego	Elmira	Mrs. Aaron Stark, Elmira	Mrs. Mayo	75	40
Ottawa	Coopersville	Mrs. John Jackson, Coopersville	Mrs. Mayo	74	30
Saginaw	Saginaw	Mrs. Mary Edgett, Saginaw, E. S.	Mrs. Rockwood	38	28
Sanilac	Sanilac Center	Mrs. H. O. Babcock, Sanilac Center	Mrs. Jones	42	18
Shiawassee	Vernon	Mrs. Hannah Mason, Owosso	Mrs. Perry	168	80
St. Clair	Capac	Mrs. C. S. King, Port Huron	Mrs. Jones	67	44
St. Joseph	Centerville	Mrs. F. E. Austin, Centerville		50	
Tuscola	Cass City	Mrs. Jas. Crosby, Cass City	Mrs. Rockwood	55	24
Van Buren	Hartford	Mrs. C. H. Sherburne, Hartford	Mrs. Rockwood	150	75
Washtenaw	Ann Arbor	Miss Jennie Buell, Ann Arbor	Miss Keller	110	
Wayne	Dearborn	Mrs. Arthur Nowlin, Dearborn	Miss Keller	60	14
Wexford	Cadillac	Mrs. Alice Bradley, Cadillac	Mrs. Rockwood	35	10
Round-up				*1,074	
Total				6,125	2,138
Average per meeting				111	44

* Three sessions.

ATTENDANCE AT FARMERS' INSTITUTES.

The following table is a summary of statistics regarding attendance at Farmers' Institutes during the past season. Reports are based on records of conductors, and other State speakers. As last year, we give total attendance, highest any session, and average per session. It will be seen that the total attendance for the past year was 100,947, somewhat less than a year ago. Figures for the four years are as follows:

1895–6	96,122
1896–7	84,061
1897–8	118,692
1898–9	100,947

The attendance at Institutes was very seriously cut into by the period of extreme cold. During the coldest week we held 12 Two-day Institutes in as many counties that always turn out large Institute audiences; attendance was easily reduced 75 per cent at these meetings by the cold. Our winter One-day Institutes in some counties were also poorly attended. This explanation is due, in view of the fact that our total attendance is less than last year. It will be observed that the highest attendance per session, which is the best barometer of number of people reached, is about the same as last year.

SUMMARY OF ATTENDANCE

AT

FARMERS' INSTITUTES 1898-9.

County.	County institutes.					One-day institutes.				All institutes.	
	Total, all sessions.	Average per session.	Highest any session.	Women's section.	Members.	No. 1-day institutes.	Total, all sessions.	Highest any session.	Average per session.	Total, all sessions.	Total, highest.
Alcona	914	152	350	126	50	1	71	48	36	985	398
Alger											
Allegan	1,115	139	215		466	5	1,319	659	109	2,434	874
Alpena	245	61	96		50	1	287	200	144	532	296
Antrim	796	133	240	78	419					796	240
Arenac	262	65	96		29					262	96
Baraga	84	42	60							84	60
Barry	1,275	159	250		150	4	1,443	711	131	2,718	961
Bay	474	68	116	40	60					474	116
Benzie	335	56	87	37	39					335	87
Berrien	485	81	149	17	114					485	149
Branch	2,343	390	520	225	332	4	2 188	1,163	199	4,531	1,683
Calhoun	1,220	174	325	150	126	1	900	500	450	2,120	825
Cass	625	125	196		77	2	627	307	104	1,252	503
Charlevoix	733	122	230	69	40					733	230
Cheboygan	526	88	223		115					526	223
Chippewa	208	42	66	30	4					208	66
Clare	850	283	500							850	500
Clinton	599	119	227	65	96	5	1,107	715	100	1,706	942
Crawford	201	67	91	65	31					201	91
Delta	15	15	15							15	15
Dickinson											
Eaton	885	177	325	100		1	150	150	150	1,035	475
Emmet	868	144	242	127	38	2	515	160	171	1,383	402
Genesee	2,644	440	650	200	96					2,644	650
Gladwin	840	168	300	85	40					840	300
Grand Traverse	1,140	163	283	116	233					1,140	283
Gratiot	1,700	243	450	145	109	1	229	133	115	1,929	566
Hillsdale	561	80	152	60	172	4	1,304	599	118	1,865	751
Houghton	270	90	105							270	105
Huron	3,009	429	700	200	332	5	1,429	695	102	4,438	1,395
Ingham	705	117	228	110	31					705	228
Ionia	740	123	175		165	5	1,651	833	118	2,391	1,008
Iosco	653	109	180	83	65	1	195	125	98	848	305
Iron	217	43	150							217	150

SUMMARY OF ATTENDANCE.—Concluded.

County.	County institutes.					One-day institutes.				All institutes.	
	Total, all sessions.	Average per session.	Highest any session.	Women's section.	Members.	No. 1-day institutes.	Total, all sessions.	Highest any session.	Average per session.	Total, all sessions.	Total, highest.
Isabella	758	108	220	80	112	1	1,000	550	500	1,758	770
Jackson	2,340	390	550	140	142	....	.....	.....	.....	2,340	550
Kalamazoo	.....	.....	.....	.....	.....	....	.....	.....	.....	.....	.....
Kalkaska	275	46	85	40	120	1	50	50	50	325	135
Kent	914	183	319	169	216	5	1,000	665	100	1,914	984
Lake	553	92	176	39	38	....	.....	.....	.....	553	176
Lapeer	1,579	263	485	90	169	4	1,224	915	153	2,803	1,400
Leelanau	120	40	60	.....	.....	....	.....	.....	.....	120	60
Lenawee	1,904	317	648	350	192	7	3,380	1,732	187	5,284	2,380
Livingston	2,455	409	675	200	110	....	.....	.....	.....	2,445	675
Luce	.....	.....	.....	.....	.....	....	.....	.....	.....	.....	.....
Mackinac	.....	.....	.....	.....	.....	....	.....	.....	.....	.....	.....
Macomb	1,423	203	395	115	266	5	1,808	827	122	3,231	1,222
Manistee	1,586	227	430	94	122	1	275	200	138	1,861	568
Marquette	.....	.....	.....	.....	.....	....	.....	.....	.....	.....	.....
Mason	621	88	193	59	74	....	.....	.....	.....	621	193
Mecosta	899	149	275	47	131	1	725	500	363	1,624	775
Menominee	541	90	170	93	56	....	.....	.....	.....	541	170
Midland	765	153	250	.....	37	....	.....	.....	.....	765	250
Missaukee	263	53	81	37	.....	....	.....	.....	.....	263	81
Monroe	1,735	347	500	60	206	3	668	409	111	2,403	895
Montcalm	1,440	240	365	.....	184	....	.....	.....	.....	1,440	365
Montmorency	34	34	34	.....	.....	....	.....	.....	.....	34	34
Muskegon	917	153	256	67	46	....	.....	.....	.....	917	256
Newaygo	496	99	156	39	60	1	145	185	73	641	241
Oakland	.....	.....	.....	.....	203	1	1,550	1,300	770	1,550	1,300
Oceana	1,195	197	350	125	103	2	819	440	163	2,014	790
Ogemaw	30	30	30	.....	22	....	.....	.....	.....	30	30
Ontonagon	203	51	78	26	.....	....	.....	.....	.....	203	78
Osceola	668	111	157	65	91	2	1,556	1,039	779	2,224	1,796
Oscoda	616	104	156	64	50	....	.....	.....	.....	616	156
Otsego	761	127	198	75	58	....	.....	.....	.....	761	198
Ottawa	1,014	169	450	74	137	2	610	330	152	1,624	780
Presque Isle	140	70	95	.....	.....	....	.....	.....	.....	140	95
Roscommon	.....	.....	.....	.....	.....	....	.....	.....	.....	.....	.....
Saginaw	550	91	132	38	162	5	1,995	1,035	166	2,545	1,167
Sanilac	744	124	300	42	250	6	2,380	1,430	238	3,124	1,730
Schoolcraft	258	129	218	.....	35	....	.....	.....	.....	258	218
Shiawassee	1,755	292	354	168	57	....	.....	.....	.....	1,755	354
St. Clair	1,226	175	313	67	121	3	661	441	110	1,887	754
St. Joseph	736	105	228	50	57	1	375	250	188	1,111	416
Tuscola	1,516	253	455	55	322	5	1,575	970	143	3,091	1,425
Van Buren	1,266	211	470	150	96	3	560	440	112	1,826	910
Washtenaw	995	166	285	110	125	....	.....	.....	.....	995	285
Wayne	1,200	200	300	60	214	5	1,066	742	97	2,286	1,042
Wexford	297	59	85	35	29	....	.....	.....	.....	297	85
State round-up	5,818	646	1,200	1,074	.....	....	.....	.....	.....	.....	.....
Totals	70,143	11,701	20,169	6,125	7,892	106	36,837	21,248	6,860	100,947	40,762
Averages	948	158	272	111	125	3	1,023	590	191	1,364	551

RELATIVE RANK OF DIFFERENT COUNTIES.

Two-Day Institutes.

Largest ten counties. (Average attendance per session.)

Rank.	County.	Place.	Attendance.	Average per session.
1	Genesee	Clio	2,644	440
2	Huron	Sand Beach	3,009	429
3	Livingston	Howell	2,455	409
4	Branch	Quincy	2,343	390
	Jackson	Grass Lake	2,340	390
5	Monroe	Carleton	1,735	347
6	Lenawee	Adrian	1,904	317
7	Shiawassee	Vernon	1,755	292
8	Gratiot	Alma	1,700	243
9	Manistee	Bear Lake	1,586	227

TEN COUNTIES HAVING THE LARGEST NUMBER OF MEMBERS.

Rank.	County.	No.
1	Allegan	466
2	Antrim	419
3	Branch	332
	Huron	332
4	Tuscola	322
5	Macomb	266
6	Sanilac	250
7	Grand Traverse	233
8	Kent	216
9	Wayne	214
10	Monroe	206

LARGEST TEN WOMEN'S SECTIONS.

Rank.	County.	No.
1	Lenawee	350
2	Branch	225
3	Genesee	200
	Huron	200
	Livingston	200
4	Kent	169
5	Shiawassee	168
6	Calhoun	150
	Van Buren	150
7	Gratiot	145
8	Jackson	140
9	Emmet	127
10	Alcona	126

LARGEST TEN ONE-DAY INSTITUTES. (SERIES.)

AS TO TOTAL ATTENDANCE.

Rank.	County.	Total attendance.	Average per session.
1	Lenawee	2,995	214
2	Sanilac	2,345	261
3	Branch	2,188	199
4	Saginaw	1,995	166
5	Macomb	1,808	122
6	Ionia	1,651	118
7	Oakland*	1,550	770
8	Barry	1,443	131
9	Huron	1,429	102
10	Allegan	1,319	109

* Summer Institutes.

PRIZES OFFERED TO FARMERS' INSTITUTE SOCIETIES.

We offered cash prizes as described below, to the various County Institute Societies of the State.

1. ATTENDANCE AT COUNTY INSTITUTES.

For the largest average attendance per session at any regular County Farmers' Institute of at least two days in length, in proportion to the farming population of the county: First prize, $10.00; second prize, $5.00.

Women's Section included in this count. The number of farming population in each county will be determined by the office of Secretary of State of Michigan. Conductor's report of attendance to be final. Children under twelve years of age not to be counted.

2. WOMEN'S SECTION.

For the largest number of farm women present at the Women's Section of a regular County Institute: Prize, $5.00.

By farm women is meant those who are actually living upon a farm. Report of the State Speaker at the Women's Section to be final. Children under twelve not to be counted.

3. ONE-DAY FARMERS' INSTITUTE.

For the largest average attendance per session at any Winter One-day Farmers' Institute at which a speaker furnished by the Board of Agriculture is present. This applies to "supplementary" One-day Institutes: Prize, $5.00.

Prize to be paid to County Institute Society controlling the successful One-day Institute. State Speaker's report of attendance to be final. Children under twelve not to be counted.

4. MEMBERSHIP.

For the largest amount of membership fees secured by any regularly organized County Institute Society for the current season: First prize, $10.00; second prize, $5.00.

Members must pay regular annual fee of Society. Complete list of members (and addresses) secured to date, must be sent to Superintendent of Institutes with other reports of Secretary. But additional names may be secured and sent in up to March 10, 1899.

No Institute Society will be entitled to any of these prizes unless all reports required by the Board of Agriculture, of the Secretary of the County Institute Society, are made within ten days after the close of the meeting for which prize is offered.

Reports received at this office within two weeks after the close of the Institute will be considered to have been sent within the 10-day limit. This requirement is in accordance with a regular rule of the board. (Rule 6 for conduct of Institutes.)

The Secretary of State furnished figures showing the number of farmers in each county in the State. The average attendance per session was compared with these figures and the percentage found.

The ten counties having highest attendance at Institutes, in proportion to farm population:

Oscoda	46%	Emmet	19%
Gladwin	33%	Iron	19%
Crawford	30%	Menominee	18%
Otsego	29%	Iosco	18%
Alcona	27%	Lake	17%
Manistee	22%	Livingston	14%

Oscoda wins first prize; Gladwin, second; Ontonagon county ranked first with 53 per cent, but disbanded its Institute Society.

The ten Women's Sections having the largest number of farm women present:

County.	*No.*	*County.*	*No.*
Livingston	150	Shiawassee	80
Calhoun	100	Kent	76
Gratiot	100	VanBuren	75
Branch	95	Manistee	73
Lenawee	88	Jackson	70

Livingston county wins this prize.

Largest ten One-day Institutes:

Place.	*County.*	*Av. per session.*
Brown City	Sanilac	433
Freeland	Saginaw	341
Bronson	Branch	301
Clinton	Lenawee	300
Hadley	Lapeer	215
Saranac	Ionia	204
Cranston	Oceana	195
Warren	Macomb	194
Bad Axe	Huron	192
Millington	Tuscola	181

Sanilac county wins this prize.

The ten counties receiving largest amount from membership fees:

Allegan	$116 25	Wayne	$51 25
Branch	83 75	Oakland	50 75
Macomb	66 50	Lenawee	47 75
Sanilac	62 25	Montcalm	46 00
Grand Traverse	58 00	Lapeer	42 25
Kent	53 75	Hillsdale	42 00

Allegan wins first; Branch, second.

RANK OF COUNTIES.

On basis of total attendance at all Institutes held during the year:

Rank.	County.	Attendance.	Rank.	County.	Attendance.
1	Lenawee	5,284	37	Washtenaw	995
2	Branch	4,531	38	Alcona	985
3	Huron	4,438	39	Muskegon	917
4	Macomb	3,231	40	Clare	850
5	Sanilac	3,124	41	Iosco	848
6	Tuscola	3,091	42	Gladwin	840
7	Barry	2,718	43	Antrim	796
8	Genesee	2,644	44	Midland	765
9	Saginaw	2,545	45	Otsego	761
10	Livingston	2,445	46	Charlevoix	732
11	Allegan	2,434	47	Ingham	705
12	Monroe	2,403	48	Newaygo	641
13	Ionia	2,391	49	Mason	621
14	Jackson	2,340	50	Oscoda	616
15	Wayne	2,286	51	Lake	553
16	Osceola	2,224	52	Menominee	541
17	Calhoun	2,120	53	Alpena	532
18	Oceana	2,014	54	Cheboygan	526
19	Gratiot	1,929	55	Berrien	485
20	Kent	1,914	56	Bay	474
21	St. Clair	1,887	57	Benzie	335
22	Hillsdale	1,865	58	Kalkaska	325
23	Manistee	1,861	59	Wexford	297
24	Van Buren	1,826	60	Houghton	270
25	Isabella	1,758	61	Missaukee	263
26	Shiawassee	1,755	62	Arenac	262
27	Clinton	1,706	63	Schoolcraft	258
28	Ottawa	1,624	64	Iron	217
29	Mecosta	1,624	65	Chippewa	208
30	Oakland	1,550	66	Ontonagon	203
31	Montcalm	1,440	67	Crawford	201
32	Emmet	1,383	68	Presque Isle	145
33	Cass	1,252	69	Baraga	84
34	Grand Traverse	1,140	70	Montmorency	34
35	St. Joseph	1,111	71	Ogemaw	30
36	Eaton	1,035	72	Delta	15

FINANCIAL STATEMENTS.

LOCAL EXPENSES FOR COUNTY INSTITUTES.

County.	Cost.	County.	Cost.
Alcona	$9 00	Lenawee	$9 40
Allegan*		Livingston	17 85
Alpena	5 06	Macomb	33 25
Antrim	24 96	Manistee	27 25
Arenac	12 88	Mason	18 50
Barry	72 00	Mecosta	14 77
Bay	18 00	Menominee	26 16
Benzie	9 28	Midland	1 15
Berrien	35 30	Missaukee*	
Branch	50 36	Monroe	9 75
Calhoun	34 76	Montcalm	25 57
Cass	8 25	Muskegon	12 81
Charlevoix	18 50	Newaygo	13 15
Cheboygan	19 18	Oceana	21 57
Chippewa	5 00	Ogemaw	2 00
Clinton	8 30	Osceola	17 75
Crawford	15 00	Oscoda	9 17
Eaton	25 00	Otsego	13 36
Emmet*		Ottawa	18 92
Genesee	25 43	Saginaw	30 50
Gladwin	8 55	Sanilac	46 35
Grand Traverse	61 87	Schoolcraft*	
Gratiot	3 94	Shiawassee	18 85
Hillsdale	41 50	St. Clair	31 35
Huron	43 61	St. Joseph	34 96
Ingham	3 50	Tuscola	25 06
Ionia	29 05	Van Buren	16 35
Iosco	8 00	Washtenaw	34 75
Iron*		Wayne	26 80
Isabella	28 70	Wexford	33 03
Jackson	31 13		
Kalkaska	43 05		
Kent	11 75	Total as reported	$1,229 86
Lake	11 72		
Lapeer	21 75	Average per county	20 50

* Failed to report.

LOCAL EXPENSES FOR WINTER ONE-DAY INSTITUTES, AND MEMBERS SECURED AT SAME.

County.	Cost.	Members secured.
Allegan*		
Barry	$37 60	108
Branch	25 00	173
Cass	7 84	44
Clinton*		
Emmet*		
Hillsdale	48 00	98
Huron	14 59	171
Ionia	21 02	90
Kent	31 07	152
Lapeer	16 00	94
Lenawee	30 15	121
Macomb	35 89	189
Monroe	3 50	52
Oceana*		
Osceola	3 80	17
Ottawa	5 60	33
Saginaw	11 90	109
Sanilac*		
St. Clair	12 00	60
Tuscola	14 05	207
Van Buren	10 00	17
Wayne	11 20	44
Total	$339 21	1,779
Average per county	18 84	98

*Failed to report.

EXPENSE TO THE STATE.

Salary of superintendent	$487 35
Traveling expenses of superintendent	57 58
Salary of clerk	303 21
Salary of lecturers	1,816 20
Traveling expenses of lecturers	2,332 18
Printing	49 75
Stationery	17 50
Office postage	110 00
Mailing bulletins	30 25
Shipping bulletins, boxing, cartage, freight	63 15
Office supplies and apparatus	72 75
Lecturers' apparatus	11 00
Telegraph and telephone	8 90
Miscellaneous cartage, Lansing to college	16 03
Sundry	22 90
Farm home reading circle	101 25
	$5,500 00

THE SPECIAL INSTITUTES.

SPECIAL FRUIT INSTITUTE.

PROGRAM.

WEDNESDAY, FEBRUARY 22, 1899.

FORENOON.

9:30. Opening exercises; remarks by Conductor, Prof. L. R. Taft.
10:00. "Small fruit culture," Prof. L. R. Taft.
10:50. "The peach orchard; location and planting," Roland Morrill, Benton Harbor.
11:45. Adjourn for dinner.

AFTERNOON.

1:15. Question box.
1:45. "Water in the air," Prof. Phillip B. Woodworth, Agricultural College.
2:35. "Diseases of pome fruits," Prof. L. R. Taft.
3:15. "The peach orchard; cultivation and care," Roland Morrill.

EVENING.

7:00. "Fertilizers," Rev. J. F. Taylor.
7:25. "Good roads," Elmer Gable.
7:50. "Farm home adornment," Miss Grace Taylor.
8:15. "Peaches—adaptability of varieties to various soils," Edward Hawley.

THURSDAY, FEBRUARY 23.

FORENOON.

10:00. "Diseases of stone fruits," Prof. L. R. Taft.
10:50. "The peach orchard; varieties," Roland Morrill.
11:45. Adjourn for dinner.

AFTERNOON.

1:15. Question box.
1:45. "Water in the soil," Prof. Phillip B. Woodworth.
2:45. "Insects attacking pome fruits," Prof. L. R. Taft.
3:15. "The peach orchard; pruning and thinning," Roland Morrill.

EVENING.

7:00. "The 'little peach' diseases," H. G. Welch.
7:25. "Co-operation in marketing fruit," W. H. Burke, Chicago.
7:50. "Girls on the farm," Mrs. S. L. Conrad.
8:15. Stereopticon lecture, illustrating "results of pruning," Roland Morrill.

FRIDAY, FEBRUARY 24.

10:00. "Insects attacking stone fruits," Prof. L. R. Taft.
10:50. "The peach orchard; marketing," Roland Morrill.
11:45. Adjourn for dinner.

AFTERNOON.

1:00. Business meeting of Allegan County Farmers' Institute Society for election of officers for ensuing year, etc.
1:30. Question box.
1:45. "Water in plants," Prof. Phillip B. Woodworth.
2:25. "Spraying," Prof. L. R. Taft.
3:15. "The horticultural situation," Roland Morrill.

SPECIAL DAIRY INSTITUTE.

PROGRAM.

WEDNESDAY, FEBRUARY 22.

FORENOON.

11:00. Address of welcome, Aaron Clark.
Remarks by conductor regarding the purpose of the Special Dairy Institute, Prof. Clinton D. Smith.

AFTERNOON.

1:30. "How the dairy cow helps the farmer," C. P. Goodrich, Ft. Atkinson, Wisconsin.
Discussion.
3:00. "Buying and raising dairy cows," A. M. Welch, Ionia.

EVENING.

7:00. Quartette.
"How, when, and what shall we feed our dairy cows?" C. C. Lillie, Coopersville.

THURSDAY, FEBRUARY 23.

FORENOON.

9:30. Question box.
9:45. "Cheap and efficient dairy barns and stalls," Prof. Clinton D. Smith.

AFTERNOON.

1:15. Question box.
1:30. "Feeds and feeding for dairy cows," C. P. Goodrich.
Discussion.
3:00. "Care of milk for the factory," G. H. True, Agricultural College.
Discussion.

EVENING.

7:00. Quartette.
Reading, Miss Maude Richmond. Hart.
"The rural school problem." Ten-minute talks as follows:
1—"The needs of district schools, from the teachers' standpoint," John Ketcham, Hastings.
2—"The needs of district schools, from the farmers' standpoint," Wm. Criddler, Middleville.
3—"How may these needs be supplied?" Mrs. Flora Beadle Renkes.
8:15. "Good roads," 10-minute talks on the following topics:
1—"What need of better roads," John H. Dennis, Hastings.
2—"Are the present laws sufficient to secure better roads?" Aaron Clark.
3—"What new legislation is necessary to bring best results?" E. N. Bates, Moline.
8:45. General discussion of "Good roads."

FRIDAY, FEBRUARY 24.

(Creamery Day).

FORENOON.

9:30. "How a creamery benefits its patrons," B. S. Holley, Woodland.
Discussion.
10:30. "The factory or the home dairy, which?" Prof. Clinton D. Smith.
Discussion.
11:35. Business meeting of the Barry County Farmers' Institute Society for the election of officers, etc.

AFTERNOON.

1:00. Reading, Ross Armstrong.
Question box.
1:15. Solo, Mrs. O. M. Hullinger.
1:30. "Uniform text-books, from the teachers' standpoint," Harry B. Andrus, Hastings.
1:50. "The farmers' side of the creamery," C. P. Goodrich.
Discussion.
2:30. General discussion of dairy matters. Answers to questions.
Five-minute speeches.
3:15. How will this Institute help me, and, through me, help my neighbors who have not attended? A. C. Jones, Middlleville.

FARMERS' DAY AT BAY VIEW.

Our speakers at this event were Mr. A. E. Palmer, of Kalkaska, and Prof. A. H. Pattengill, of the University. The subject of the former was "Good roads under the County System," and that of the latter "What shall we do with our barren lands?"

THE STATE ROUND-UP.

The State Round-up, held at Pontiac, Oakland county, was an unqualified success. The attendance from outside of the county was not quite so large as similar attendance at the Agricultural College the year previous, but the total attendance was the largest of any Institute yet held in the State. Great credit is due to the committees of the Oakland County Institute Society having local work in charge. Arrangements were complete, Pontiac citizens aided freely, and the meeting was evidently welcomed.

LIST OF DELEGATES TO ROUND-UP.

Following is a list of all who registered at the Round-up, 118 outside of Oakland county. Doubtless some did not register:

ATTENDANCE AT ROUND-UP.

County.	Name.	Address.	Organization represented.
Allegan, 1	T. G. Adams	Shelbyville	Institute Society.
Antrim, 1	C. E. Mills	Mancelona	" "
Bay, 1	F. W. Dunham	West Bay City	Monitor Farmers' Club.
Branch, 1	D. D. Buell	Union city	Grange.
Eaton, 2	Geo. A. Perry	Charlotte	Agricultural Society.
	N. P. Hull	Dimondale	Windsor Grange.
Emmet, 1	John Swift	Harbor Springs	Institute Society.
Genesee, 8	W. R. Freeman	Flushing	" "
	John R. Walker	Grand Blanc	Farmers' Club.
	H. Walker	Grand Blanc	
	L. Brown	Clio	
	C. S. Johnson	East Thetford	Institute Society.
	Mrs. Ida Phillips	Davison	" "
	S. R. Billings	Davison	" "
	Frank H. Hill	Davison	" "
Gd. Traverse, 1	S. H. Sayler	Yuba	" "
Gratiot, 1	Mrs. Stiles Kennedy	St. Louis	Monday Club.
Houghton, 1	William Frank	Lake Linden	Institute Society.
Huron, 5	Mrs. Geo. Pangman	Verona Mills	" "
	Mrs. John Hunt	Verona Mills	" "
	J. S. Gilbert	Sand Beach	
	Jos. J. Leszeynski	Sand Beach	Institute Society.
	John Hunt	Verona Mills	" "
Ingham, 3	H. M. Young	Mason	" "
	Mrs. P. G. Towar	Lansing	Capitol Grange.
	P. G. Towar	Lansing	" "
Ionia, 4	A. M. Welch	Ionia	Institute Society.
	Byron L. Pierce	Pewamo	
	Ira Welch	Portland	
	U. J. Maynard	Portland	
Jackson, 3	M. H. Crafts	Jackson	Farmers' Club.
	Mrs. M. H. Crafts	Jackson	" "
	David A. Croman	Munith	

ATTENDANCE AT ROUND-UP.—CONTINUED.

County.	Name.	Address.	Organization represented.
Lapeer, 9	T. C. Taylor	Almont	
	Geo. E. Dent	Lapeer	Institute Society.
	Mathias Caley	Hunters Creek	" "
	A. E. Springett	Almont	
	F. E. Odell	Lapeer	Institute Society.
	Mrs. F. E. Odell	Lapeer	" "
	E. P Millis	Lapeer	" "
	Mrs. Geo. E. Dent	Lapeer	" "
	Arthur J. Schanck	Thornville	
Lenawee, 2	O. D. Colegrove	Morenci	Morenci Grange.
	A. B. Graham	Sand Creek	Madison Grange.
Livingston, 4	H. E. Reed	Howell	Institute Society.
	Horace P. Bump	Howell	Marion Farmers' Club.
	W. K Sexton	Howell	Institute Society.
	Mrs. W. K. Sexton	Howell	" "
Macomb, 9	S. B. Cannon	Washington	Farmers' Club.
	C. M. C. Scott	Romeo	
	John Hooker	New Baltimore	
	Ronson German	New Baltimore	
	F. C. Miller	Washington	Farmers' Club.
	Geo. A. True	Armada	
	Mrs. Geo. A. True	Armada	
	W. E Day	Armada	
	Geo. Mann	Mt. Vernon	
Midland, 1	Geo. W. Beckley	Laporte	Institute Society.
Monroe, 7	Albert Bond	London	" "
	Angie D. Bond	London	" "
	W. A. Heiss	Maybee	
	J. W. Morris	Monroe	Farmers' Club.
	J. Sortor	Monroe	" "
	Mrs. J. Sortor	Monroe	" "
	J. J. Lautenschlager	Carleton	Exeter Farmers' Club.
Montcalm, 3	J. L. Case	Greenville	
	Frank J Case	Greenville	
	Mrs. Mary Sherwood Hinds	Stanton	Stanton Grange.
Sanilac, 5	Richard E. Walker	Sanilac Center	
	Irvin W. Hall	Buel	Buel Center Grange.
	Wesley Schlichter	Brown City	Institute Society.
	Owen F. Treple	Sanilac Center	
	Simon Bricker	Brown City	Institute Society.
Shiawassee, 4	A. B Cook	Owosso	" "
	A. Cole	Durand	
	C. P. Reynolds	Owosso	Maple River Farmers' Club.
	William Kerr	Vernon	
St. Clair, 6	Albert Tosch	Capac	Capac Grange.
	C. S. King	Pt Huron	Institute Society.
	Mrs. C. S King	Pt Huron	" "
	Henry E. Dysinger	Riley Center	Farmers' Club.
	Geo. W. Howe	Pt. Huron	Michigan League Good Roads.
	Jas. Dunn	Emmett	Institute Society.
Tuscola, 6	Daniel Case	Millington	Farmers' Club.
	Clark Baker	Denmark	Institute Society.
	J. W. Murphy	Cass City	" "
	N. E York	Millington	" "
	J. E. Lewis	Vassar	Progress Farmers' Club.
	John Marshall	Cass City	Institute Society.
Van Buren, 1	Wm. Deming	Bangor	Bangor Grange.
Washtenaw, 5	Mrs. Wm. Campbell	Ypsilanti	
	Wm. Campbell	Ypsilanti	Institute Society.
	Mrs. B. D Kelly	Ypsilanti	Fraternity Grange.
	B. D. Kelly	Ypsilanti	" "
	O. C. Burkhart	Chelsea	Lafayette Grange.

ATTENDANCE AT ROUND-UP.—CONCLUDED.

County.	Name.	Address.	Organization represented.
Wayne, 26	Geo. A. Welle	Flat Rock	Grange.
	M W. Fulton	Highland Park	
	Edwid Hodge	Plymouth	
	Mrs. Edwin Hodge	Plymouth	
	C. F. Riggs	Bellville	
	John Fulton	Highland Park	
	Mrs. John Fulton	Highland Park	
	M H Houghton	Wayne	Institute Society.
	Mrs. Joel C. Bradner	Plymouth	
	Joel C. Bradner	Plymouth	
	Chas. Downing	Romulus	Institute Society.
	Albert McClaughry	Romulus	
	Jas. R. Clark	Bellville	Institute Society.
	Henry W. Grix	Highland Park	
	I N Perin	Wallaceville	
	Stanley McPherson	Wyandotte	Willow Grange.
	J. E. Morse	Detroit	
	O. P. Galley	Dearborn	Institute Society.
	L. T. Maples	Woodmere	
	Frank K. McDonald	Detroit	
	W. F. Barr	Detroit	
	Geo. C. Peterhans	Plymouth	Institute Society.
	J. L. Chase	Detroit	" "
	J. M. Rindall	Detroit	
	T. H. Brown	Highland Park	
	Alex Laurain, Jr.	Woodmere	

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ATTENDANCE AT OFFICERS' CONFERENCES.

County.	Name.	Address.	Office.
Bay	F. W. Dunham	West Bay City	Secretary.
Eaton	N. P. Hull	Dimondale	Vice-president.
Emmet	John Swift	Harbor Springs	Vice-president.
Genesee	Frank H. Hill	Davison	Secretary.
Hillsdale	Elias F. Brown	Reading	President.
Huron	John Hunt	Verona Mills	President.
	Mrs. Geo. Pangman	Verona Mills	Secretary.
Ingham	P. G. Towar	Lansing	Vice-president.
	Harvey M. Young	Mason	Secretary.
Ionia	U. J. Maynard	Portland	Vice-president.
	A. M. Welch	Ionia	President.
Lapeer	T. C. Taylor	Almont	Vice-president.
Lenawee	A. B. Graham	Sand Creek	Secretary.
Livingston	H. E. Reed	Howell	Secretary.
Monroe	J. W. Morris	Monroe	Vice-president.
	J. J. Lautenschlager	Carleton	Vice-president.
Montcalm	H. H. Hinds	Stanton	Vice-president.
Oakland	F. F. Downey	Thayer	Vice-president.
	J. Y. Clark	Orion	Secretary.
	G. D. Cowdin	Oakwood	Vice-president.
	P. Voorheis	Pontiac	Vice-president.
	M. L. Frink	Oxford	Vice-president.
	R. K. Divine	Holly	Vice-president.
	C. S. Bartlett	Pontiac	Treasurer.
	J. G. Noble	Oxford	President.
	J. J. Snook	Rochester	Vice-president.
Sanilac	S. Bricker	Brown City	Secretary.
	Wesley Schlichter	Brown City	President.
Shiawassee	A. B. Cook	Owosso	Secretary.
St. Clair	Jas. Dunn	Emmet	Secretary.
	Chas. S. King	Port Huron	President.
	Mrs. Chas. S. King	Port Huron	Chm. Women's Sec.
Tuscola	Clark Baker	Denmark	Vice-president.
	J. E. Lewis	Vassar	Vice-president.
	N. E. York	Millington	President.
Washtenaw	G. T. English	Chelsea	Vice-president.
	Wm. Campbell	Ypsilanti	President.
Wayne	Jas. J. Savage	Bellville	Vice-president.
	Randolph Graden	Taylor Center	Secretary.

MISCELLANEOUS.

CO-OPERATIVE EXPERIMENTS.

A plan of co-operative experiments, as outlined on page CXII of last year's Institute bulletin, was carried out with some degree of success. The following table shows the counties where the experiments were tried, the kind of experiments tried, and the opinion of the county secretaries as to whether they were valuable and should be continued.

CO-OPERATIVE EXPERIMENTS.

FROM REPORTS SECRETARIES COUNTY INSTITUTE SOCIETIES.

County.	Number and kind.	Valuable? Helpful?	Continue?
Alcona	1—Sugar beet 2— 3—	Yes	Yes.
Calhoun	1—Potatoes 2—Farm accounts. 3—Sugar beets.	Yes	Yes.
Chippewa	1—Sugar beet 2— 3—	Yes	Yes.
Crawford	1—Farm accounts 2— 3—	Yes	Yes.
Grand Traverse	1—Sugar beets 2—Potato varieties. 3—Farm accounts. Potatoes, amount of seed.	Yes	Yes.
Livingston	1—Potato 2—Corn. 3—Sugar beets.	Yes	Yes
Mecosta	1—Report on new varieties 2— 3—	Yes	Yes.
Monroe	1—Sugar beets. 2— 3—		
Newaygo	1—Seed test for potatoes 2—Variety test for potatoes. 3—Farm accounts.	Yes	Yes.
Osceola	1—Sugar beets. 2—Corn 3—	Yes	Yes.
Oscoda	1—Sugar beets 2— 3—	Yes	Yes.
Otsego	1—Sugar beets 2— 3—	Yes	Yes.
Ottawa	1—Sugar beets 2—Variety potatoes. 3—Amount of seed. Cost of corn and oats.	Yes	Yes.
Tuscola	1—Corn culture 2—Variety potatoes. 3—	Yes	Yes.
Van Buren	1—Potatoes 2—Farm accounts. 3—		Cannot advise.

PRIZE REPORTS OF FARMERS' INSTITUTES.

Last autumn the following circular letter was sent to superintendents of schools at each point where a County Farmers' Institute was to be held during the winter. The circular explains itself:

Prizes to pupils of graded and high schools, offered by the Michigan Agricultural College in connection with Farmers' Institutes:

I. The contestants must be pupils actually enrolled in the high school or graded school of the town or village where the County Institute is held. (This contest does not apply to the so-called One-day Institutes.)

II. Contestants must attend at least one session of the Institute and make a written report of the proceedings of that session, giving a synopsis of each talk or paper presented, together with an intelligent report of the discussions which follow.

III. These reports must not be over 1,200 words in length, neatly written on one side of the paper, in ink.

IV. The report must first be judged by committees appointed by the superintendent or principal of the school, and judged on the basis (1) of value as a complete report of the entire session, and (2) as to literary excellence.

V. The two reports (one by a young man, the other by a young woman) judged by local committees to be the best written by any pupils in the school, to be forwarded to the Superintendent of Institutes not later than March 15, 1899.

VI. Reports sent to the Superintendent of Institutes will be judged by competent persons designated by the Superintendent.

VII. Young men contesting must attend one general session of the Institute, preferably an afternoon session. Young ladies contesting for the premiums must attend the Women's Section of the Institute, if one is held.

PRIZES.

The Agricultural College offers the following prizes for the most successful competitors in this contest:

1. To the young man sending in the best essay under the above rules, the Agricultural College will remit room rent for one year. This will amount to about $15 or $20, according to the room chosen.

2. To the young lady sending in the best essay under the above rules, the Agricultural College will remit room rent for one year. This will amount to about $15 or $20, according to the room chosen.

3. Any one securing either of these prizes will have the privilege of entering the College and utilizing the prize at any time within three years.

4. Reports from at least eight different schools must be received before the prizes become available.

THE MICHIGAN AGRICULTURAL COLLEGE,
J. L. SNYDER, President.
I. H. BUTTERFIELD, Secretary.

We have received reports, as the results of this competition, from 18 schools. A total of 425 students attended the Institutes at the various points, 220 of these being boys and 205 girls. Of those attending 149 entered as competitors under this prize contest, 71 of these being boys and 78 of them girls. Pupils from several other schools attended the Institutes, but did not compete, and no report was made to us. A total of 15 essays written by young ladies, and 16 written by young men, was sent to the College for final judgment. Three of the essays by young men were too long, much overrunning the limit of 1,200 words. These, unfortunately, had to be thrown out of the contest, leaving thirteen competitors among the young men.

The following table shows the names of the schools competing, the attendance at the Institute from boys and girls from various schools, the number of those competing, and the names of writers of the essays sent in for final decision.

The essays were turned over to the proper authorities at the College, and according to their judgment the following are entitled to the prizes: Of the young men, Mr. Raymond H. Bangs, of the Alma school, receives first prize. Of the young

women, Miss Margaret B. Preston, of the Grass Lake school, receives first prize. These young people are therefore entitled to room rent for one year in the Agricultural College, and may take advantage of the prize at any time during the next three years.

The superintendents of the various schools in making reports, in reply to questions asked, are almost unanimous in their view that the plan is a good one for arousing interest, among high school pupils, in agricultural education, and they also nearly unanimously recommend that the plan be continued. Many more schools competed than a year ago, and we hope that if the plan is continued a still larger number of schools will compete another winter. We publish both prize essays in full.

Name of school.	Attendance at institute.		Number competing.		Names of successful writers in institute.
	Boys.	Girls.	Boys.	Girls.	
Alma	12	8	2	0	Raymond H. Bangs.
Bear Lake	18	22	3	5	Geo Harris. Nellie Holliday.
Cass City	8	3	1	1	Morris W Knight. Kate Z nnecker.
Capac	4	3	4	3	Geo Churchill. Helen Brumm.
Centerville	2	2	2	2	Albert Tim. Ruth Frackish.
Clio	9	16	9	16	John Cashin. Bessie Daniells.
Elmira	30	25	5	6	Wm E. Laycock.
Grass Lake	12	7	3	3	Wesley H DuBois. Margaret B Preston.
Kalkaska	12	3	7	1	Lyman H. Boyd. Pearl Barnard
Marshall	8	7	5	5	Searles Riesley. Ethel Freed.
Middleville	4	7	4	6	Claire Watson. Netti Southwick.
Ontonagon	5	12	5	12	Harry Corgan. Ella Halter.
Portland	9	6	5	2	Cass Lockwood. Eva Stevens.
Quincy	30	40	0	2	Inis Herrick.
Rockford	------	------	2	------	------
Shelby	15	16	1	1	Bert Hamill. Linda Sandburg.
Stephenson	12	8	6	2	Albert Temple. Florence Loth.
Williamston	30	20	7	11	Rockwell Dietz. Nellie Wilson.
	220	205	71	78	
Total		425		149	

PRIZE REPORT OF GRASS LAKE INSTITUTE, WOMEN'S SECTION.

BY MARGARET B. PRESTON.

The women's section of the State Farmers' Institute was held in the M. E. church Thursday afternoon, February 16. There was an attendance of about 75 ladies from the farm, 50 from the village and 17 school girls. The session was opened by singing America, after which Mrs. Remington offered prayer.

Miss Lucy Smith then read a paper on "Art Decorations in our Homes," which was full of good suggestions. She spoke first of the choice and hanging of the pictures. Two important points in choosing are quality and meaning. Copies of the most famous pictures can be bought in brown tints which do not cost much

and can scarcely be told from better pictures. It is not advisable, however, to buy cheap colored pictures.

Pictures may present something from history, or they may be flowers or landscapes, but whatever they are they should appeal to our minds, and we ought to learn to interpret them. In some we see great truths presented and in others we are brought in contact with other countries. In the home as well as the school the pictures should teach lessons of patriotism, purity and religion.

For a frame, select something simple and in harmony with the picture. The Ladies' Home Journal has given very good hints in the line of hanging pictures. A good background is necessary. High colors in wall paper spoil the effect. If the paper is not plain, it should at least have a simple design in subdued colors. Few people can afford to have statuary in the home, but there are pretty plaster paris moulds which are quite inexpensive. Miss Smith closed with the quotation that says our minds are galleries filled with pictures and by refusing to look at the evil ones they gradually disappear.

The discussion was opened by Mrs. Hookway, who said that colors should be adapted to the rooms and that carpets and rugs should be in harmony with other furnishings. Mrs. David Rowe told how two girls were influenced by pictures over their beds. Mrs. Minnie Clark thought that the blue prints of Madonnas, etc., ought to take the place of the meaningless, highly colored pictures in children's rooms.

This closed the discussion and the next thing on the program was "A Talk with Home Makers" by Mrs. Ella M. Rockwood, but as Mrs. Rockwood was unable to be there, Miss Rushmore of the Agricultural College gave a lesson on eggs. She wore a white shirt waist, white apron and dainty little white muslin cap, and looked very neat and attractive. She had with her a chafing dish, a number of kitchen utensils and material for making custard, curried eggs, and egg omelet. Her chafing dish was composed of an alcohol lamp with a frame above it to support the cooking-pan.

First she made custard, explaining the reason for everything she did. I will not attempt in this space to give the recipes she used, but will tell a little about her methods. For custard always use a double cooker. Custard is cooked when it sticks to the spoon. If it is cooked too long it will curdle, that is the heat will harden the albumen in the egg too much. If this should happen, set the pan containing the custard in a pan of cold water and beat the custard with a revolving egg-beater. This will bring it back if it has not gone too far. In beating eggs the object is to get air in and if a little salt is put in, it will toughen the egg and make it hold air better.

While making the custard, Miss Rushmore gave an interesting talk on eggs. They are very nutritious as a food. An analysis of one pound (about 10 eggs) shows that in this amount there are two-thirds pound water, 2 ounces albumen, 2 ounces fat and a very small quantity of mineral matter. The mineral matter is very necessary for the growth of teeth and bones. Nourishment such as albumen and fat build up the muscles and give heat to the body. Albumen is one of the most nourishing of foods and is found in a purer form in the white of eggs than in any other place. The value of eggs as a food depends upon their digestibility and price. The cost of a food must always be considered. Albumen is more digestible raw than cooked. We cook it because it looks better and tastes better. The question is often asked, what makes eggs bad? The shell is not air-tight as is often supposed, but is porous and the air which enters through the shell makes eggs bad. A very good way to keep them is to rub them over with lard or vaseline. They should stand point downward and be kept in a cool place.

Miss Rushmore next made curried eggs. For this she cut up hard boiled eggs and poured over them a sauce which she made, using curry powder. While cooking the sauce she spoke of the importance of cooking starch-food thoroughly, since raw starch causes indigestion. Starch is found in tiny grains and the starch grains of wheat, rice, corn, etc., all have different forms. Cooking of starch is one of the first lessons taken up at the College. Animal starch is found in a very small quantity in the liver. In each meal, one should study to have the proper proportion of starch, fat, and muscle food. The Chinese eat starch almost entirely and cannot withstand disease as well as people who eat meat.

Next, Miss Rushmore made egg omelet. Each of the three dishes she prepared was passed around to the ladies in the audience, as soon as finished.

Then she told about the course for girls at the College. In the cooking department, they are taught how to cook the different kinds of food and the food value of each. There is also a waitress' course and in the second year a course of lectures on domestic science and also a study of what to do in case of sickness and emergency.

In the sewing department, they begin with plain sewing and gradually advance until they can cut and make lined dresses.

This closed Miss Rushmore's talk and the lady choir gave a selection. Mrs. Ada Cooper then read a paper on "The Minor Duties of Life." The heroic age of Greece and Rome has departed and now real greatness lies in doing well the little duties in life. She who leaves home and goes from battlefield to battlefield tending the sick and wounded is the greatest heroine we can find.

It is not by one act of greatness but by constant and careful attention to the minor duties that character is moulded. We should be careful not to waste our time, energy or opportuniities. Each minute has its purpose. Opportunities are duties.

The question box was taken up next. A number of questions about the Agricultural College, also about the lesson on eggs, indicated an interest in the work Miss Rushmore represented.

The session was closed with another selection from the lady choir. The general impression left on those present at the meeting seemed to be a pleasant one.

PRIZE REPORT OF ALMA INSTITUTE, GENERAL SESSION.

BY RAYMOND H. BANGS.

Mr. Allen, the chairman of the County Board of Agriculture, called the meeting to order and introduced as first speaker of the session, Mr. Jason Woodman of Paw Paw.

Mr. Woodman's subject was "Building Up an Exhausted Farm," a subject interesting to all, especially to farmers whose soil is sand.

He explained how injurious it was to over crop land and asserted that we will have to grasp some new method of farming or quit the business. Farms are growing old and farmers are beginning to see that the fertility is not what it once was. The natural fertility, caused by accumulation, during past ages, of the ever decaying leaves from the forests, is giving out.

What is to be done to restore the fertility? Mr. Woodman gave some very good hints how this may be accomplished. He said that everything in the line of refuse matter should be spread on the land as fertilizer. Many farmers burn up matter that could well be used for this purpose.

He thinks we should keep enough stock on our farms to use up all our surplus hay and grain; thus it may be converted into fertilizer and go back into our own soil instead of some other man's.

In most cases it should be well rotted before being spread on the ground, although a light coat of straw spread over a meadow or pasture field causes the grass to grow more rapidly and makes a thicker sod, which is very valuable as fertilizer when turned under.

Mr. Woodman thinks clover is one of our best means of restoring fertility, no matter if the insects do bother it. He says that the roots strike deeper into the ground and draw more fertility to the surface than most plants. If there is an abundance of rainfall during the summer, it is a good plan to plow ground early in the spring, cultivate well, and sow to clover about the middle of June. Insects do not work in such clover as bad as in that sowed in the early spring.

Of the different kinds of clover he asserts that mammoth red has borne the best test, that is for all purposes. Crimson clover probably ranks fourth; it is an excellent plant to be grown around fruit trees. Alfalfa, he has no use for. Its roots are too large, and to plow up an Alfalfa meadow which is two or three years old, is about like plowing among the roots of a grub oak thicket.

Mr. Woodman stated that beans and corn, if turned under when green, enrich the soil as much as a good coat of well rotted manure. He gave one process for enriching the soil which I believe would be a good one for some of our farmers to try. Sow rye in the fall of the year, plow it up early in the spring, sow to rape about the middle of May and continue the process for four or five years. The rape makes splendid pasture, therefore the land may be of some value while its fertility is increasing. He cautioned farmers to be very careful about leaving the manure from the stables in a position where the water from the eaves could drop down upon it, and added that few men realize the loss occasioned by being careless about such seemingly small matters. This ended Mr. Woodman's talk.

Prof. Smith of the Michigan Agricultural College was introduced as second speaker. Sugar Beets was his topic. This subject was perhaps more interesting to

farmers than anything during the whole institute, judging by the number of questions asked Mr. Smith.

Professor Smith said he had visited California, Nebraska, and all the other states where sugar beets were being grown and declared that Michigan's prospects for leading the industry are better than any other state. (Applause.) What is necessary for a good sugar beet locality is good black loam soil and plenty of rainfall. Michigan has both. (Applause.) Clay soil is not adapted to the industry, as it causes the beets to grow in a sprangly form and is very difficult to clean from the roots.

Muck soil grows too large beets, and is not generally used for such. He thinks the ground for beets should be plowed quite deep, but adds that it all depends on the fertility and hardness of the soil. The seed should be from beets bearing high test and free from weed seed, and fifteen pounds should generally be sown to each acre, that is, when the rows are twenty inches apart. The reason for putting so much on each acre is to make certain that no breaks occur in the rows.

Where ground is full of weed seed it is well to sow turnip seed with the beet seed; turnip seed germinates more quickly and one is enabled to see the rows better. In this way the weeds may be cut out before the beets appear above the ground. He stated that it would be unprofitable for farmers to use the common grain drill for sowing beets. The drills used sow two rows at a time.

Prof. Smith cautioned farmers not to let beets get too large before weeding and thinning. As soon as the rows can be easily seen the work should commence. They should be thinned out to one single beet every seven inches. The job is a difficult one; he figured that it took one person working seven and one-half hours a day, seven and one-half days to weed and thin an acre of them. The first time through them is the hardest part, for after they get large enough to shade the ground little care is required. He said that the pulling and topping costs about six dollars per acre, but predicted that in the near future some American ingenuity would appear in the form of a beet harvester. The harvesting time is most critical of all business. A heavy rainfall, when they are ready to harvest, is liable to cause a second growth.

By careful figuring, Prof. Smith proved that it does not pay for farmers to grow sugar beets where they have more than five miles to haul them. Persons living two or three miles from the factory can haul four or five loads each day, but those living five miles cannot take more than two loads per day. The cost of raising an acre of beets varies—costing from thirty to forty dollars per acre, and the net profit runs from ten to thirty dollars per acre.

Numerous questions were asked both speakers of the session, who answered very satisfactorily, showing that they had a thorough knowledge of their subjects. One question was asked Prof. Smith which may be of interest to some. Would the sugar beet industry be a profitable one if the bounty were removed? He proved that farmers would realize from three and one-half to four dollars per ton if there was no bounty at all.

This ended the afternoon session and the meeting stood adjourned.

MISCELLANEOUS FIGURES.

From reports of State speakers we learn that of all the County Institutes held last year 76 per cent of the audiences were farmers; 36 per cent were under forty years of age; and 25 per cent of the general audiences were women. At the first afternoon session of all our County Institutes, 15 per cent came over 8 miles to attend the meeting, and the second afternoon, 13 per cent. 26 per cent of all those attending the third session had attended all previous sessions. The proportion of farmers in the audience the first evening was 43 per cent of the total attendance; the second evening, 29 per cent.

Membership County Institute Societies.

County.	1895-6	1896-7	1897-8	1898-9
Alcona	23	20	46	50
Alger				
Allegan	78	75	113	466
Alpena	27	16	50	50
Antrim	80	70	332	419
Arenac		68	30	29
Baraga				
Barry	112	49	73	150
Bay	70	74	49	60
Benzie	74	40	29	39
Berrien	52	79	262	114
Branch	175	145	130	332
Calhoun	110	112	200	126
Cass	98	37	75	77
Charlevoix	57	42	44	40
Cheboygan	79	60	145	115
Chippewa	63	128	22	4
Clare				
Clinton	43	40	82	96
Crawford	51	38	44	31
Delta				
Dickinson	25	25		
Eaton				
Emmet	65	25	138	38
Genesee	86	87	89	96
Gladwin	39	12	44	40
Gogebic				
Grand Traverse		215	240	233
Gratiot	76	179	121	109
Hillsdale	90	52	290	172
Houghton				
Huron	211	130	261	332
Ingham	72	34	60	31
Ionia	227	161	161	165
Iosco	11	31	35	65
Iron	36		35	
Isabella	72	77	72	112
Jackson	80	57	410	142
Kalamazoo				
Kalkaska	80	71	126	120
Kent	359	106	132	216
Keweenaw				
Lake	32	67	22	38
Lapeer	75	72	33	169
Leelanau				
Lenawee				192
Livingston	54	70	155	110
Luce				
Mackinac				
Macomb	47	80	84	266
Manistee	60	122	135	122
Marquette	25	49	66	
Mason	32	43	102	74
Mecosta	69	21	45	131
Menominee	21	15	22	56
Midland	51	54	15	37
Missaukee	45	22		
Monroe	64	221	196	206
Montcalm	54	44	209	184
Montmorency				
Muskegon	67	55	67	46
Newaygo	53	67	76	60
Oakland	93	58	334	203
Oceana	65	69	78	103
Ogemaw	50	56	24	22

MEMBERSHIP COUNTY INSTITUTE SOCIETIES.—Concluded.

County.	1895-6	1896-7	1897-8	1898-9
Ontonagon	40	40	26	-------
Osceola	66	32	145	91
Oscoda	22	36	31	50
Otsego	45	32	46	58
Ottawa	42	90	200	* 137
Presque Isle	-------	-------	-------	-------
Roscommon	-------	-------	-------	-------
Saginaw	44	45	102	162
Sanilac	100	282	80	250
Schoolcraft	-------	-------	-------	35
Shiawassee	128	44	83	57
St. Clair	27	190	183	121
St. Joseph	129	44	159	57
Tuscola	30	51	79	322
Van Buren	-------	-------	55	96
Washtenaw	119	83	211	125
Wayne	174	102	32	214
Wexford	65	58	45	29
Totals	4,709	4,669	7,080	7,892

ACKNOWLEDGMENTS.

In closing our four years of Institute work we desire once for all to acknowledge the efficient and self-sacrificing services of the great majority of presidents and secretaries of County Institute Societies. Without their energy, intelligence and interest no system of Institute work could be made a success in Michigan. Most of them served without price —their only reward the consciousness of work well done. It has been a genuine pleasure to become acquainted with this large band of intelligent farmers, and it has proved one of the items that have made the work interesting.

Nor is it out of place to speak a word of praise for our State speakers. When the Institute work began, there was hardly a man in the State, outside of the Agricultural College, who had had experience in addressing Farmers' Institutes. Today we have a corps of workers that will compare with those of any State in the country. The work they have done for Michigan agriculture cannot be calculated in dollars and cents They have left in their wake not only valuable information, but inspiration, kind words, and the impression that always comes from contact with strong men and women. We are proud to have been co-laborers with them.

As is well known, the financial end of the work has been largely relieved by the hearty co-operation of the railroads of the State in granting half rates to our workers. Hotel proprietors, also, have almost uniformly assisted in the same manner. Newspapers of the State have always been apparently eager and glad to assist in their respective counties.

While undoubtedly the Institute system which has been built up in Michigan during the past four years has its weaknesses, we believe it is a system organized on right principles, adapted to the needs of Michigan, and capable of large expansion of service without greatly increased expenditure of money. We believe the work it has done for Michigan agri-

culture and agricultural education is of considerable moment. We hope that in the future it may expand and develop in accordance with its capacity as a means of bringing knowledge, inspiration, and encouragement to the farmers of the State.

PRESIDENTS AND SECRETARIES OF COUNTY FARMERS INSTITUTE SOCIETIES FOR 1899–1900.

Counties.	President.	Address.	Secretary.	Address.
Alcona	J. Van Buskirk	Harrisville	L. A. Colwell	Harrisville.
Alger*				
Allegan	T. G. Adams	Shelbyville	C. E. Bassett	Fennville.
Alpena	J. D. Kingsbury	Alpena	E. H. Toland	Ossineke.
Antrim	Gilbert T. Bentley	Atwood	W. E. Byers	Atwood.
Arenac	Nelson Deford	Maple Ridge	S. R. Hoobler	Saganing.
Baraga*				
Barry	Walter J. Robinson	Middleville	W. R. Harper	Middleville.
Bay	Anthony Kern	Auburn	Wm. Gaffney	W. Bay City.
Benzie	C. B. Canniff	Benzonia	R. B. Reynolds	Frankfort.
Berrien	A. N. Woodruff	Watervliet	L. A. Stuart	Spinks Corn'rs.
Branch	J. D. Studley	Union City	E. E. Lewis	Coldwater.
Calhoun	C. C. McDermid	Battle Creek	Frank Minges	Battle Creek.
Cass	Jas. H. Hayden	Cassopolis	J. B Harmon	Cassopolis.
Charlevoix	M. M. Burnham	East Jordan	E. B. Ward	Charlevoix.
Cheboygan	P. L. LaPres	Cheboygan	Q. C. Ball	Mullet Lake.
Chippewa	Simon Parker	S'lt Ste. Marie	E. Batdorf	Strongville.
Clare*				
Clinton	Jerome Dills	Dewitt	Henry N. Webb	Dewitt.
Crawford	Perry Ostrander	Grayling	Jno. J. Coventry	Frederic.
Delta*				
Dickinson*				
Eaton†	Jas. H. Gallery	Eaton Rapids	Geo. A. Perry	Charlotte.
Emmet	R. C. Light	Bay Shore	E. A. Botsford	Petoskey.
Genesee	S. R. Billings	Davison	Frank H. Hill	Davison.
Gladwin	Frank Leonard	Gladwin	H. R. Clarke	Gladwin.
Gogebic*				
Grand Traverse	Robt. Barney	Traverse City	E. O. Ladd	Traverse City.
Gratiot	Newton Burns	St. Louis	Walter M. Comstock	Ithaca.
Hillsdale	E. F. Brown	Reading	Earl H. Dresser	Litchfield.
Houghton*				
Huron	John Hunt	Verona Mills	Mrs. Geo. Pangman	Verona Mills.
Ingham	Harvey Wilson	Mason	Harvey M. Young	Mason.
Ionia	Amos Welch	Ionia	C. A. Preston	Ionia.
Iosco	H. L. Drake	Tawas City	Len J. Patterson	Tawas City.
Iron	Olaf Helgemo	Iron River	Fay G. Clark	Iron River.
Isabella	W. W. Preston	Mt. Pleasant	M. E. Kane	Mt. Pleasant.
Jackson	H. E. Dewey	Concord	Floyd Goodrich	Concord.
Kalamazoo*				
Kalkaska	Wm. Diek	So. Boardman	Wm. T. Hayward	So. Boardman.
Kent	L. J. Rindge	Grand Rapids	Wm. K. Munson	Grand Rapids.
Keweenaw*				
Lake	S. Fradenberg	Reed City	W. S. Gordon	Chase.
Lapeer	W. W. Stickney	Lapeer	G. W. Carpenter	Lapeer.
Leelanau*				
Lenawee	M. T. Cole	Palmyra	A. B. Graham	Sand Creek.
Livingston	Frank R. Crandal	Howell	H. E. Reed	Howell
Luce*				
Mackinac*				
Macomo	E. H. Peck	Warren	Frank D. Wells	Rochester.

PRESIDENTS AND SECRETARIES OF COUNTY FARMERS' INSTITUTE SOCIETIES FOR 1899–1900.– CONCLUDED.

Counties.	President.	Address.	Secretary.	Address.
Manistee	W. W. Wood	Yates	J. H. Read	Pomona.
Marquette*				
Mason	E. P. Bidwell	Scottville	S. A. Louden	Scottville.
Mecosta	Arnold Ely	Big Rapids	F. F. Kiefer	Borland.
Menominee	Edw. Sawbridge	Stephenson	Norwood Bowers	Stephenson.
Midland	Jas. Anderson	Midland	J. H. Johnson	Laporte.
Missaukee*				
Monroe	Albert Bond	London	John Nichols	Ida.
Montcalm	J. E. Gibbs	Edmore	A. N. Demoray	Edmore.
Montmorency*				
Muskegon	S. A. Aldrich	Muskegon	J. H. Whitney	Muskegon H'ghts.
Newaygo	S. V. Walker	Hesperia	W. C. Stuart	Fremont.
Oakland	G. M. Trowbridge	Pontiac	Fred B Giddings	Pontiac.
Oceana	Benton Gebhart	Hart	C. F. Hale	Shelby.
Ogemaw	C. J. Phelps	W. Branch	G. G. French	West Branch.
Ontonagon*				
Osceola	Reese Jones	Tustin	G. D. DeGoit	Tustin.
Oscoda	Chas. Kittle	Mio	Robt. Shepard	Biggs.
Otsego	W. J. Jubb	Gaylord	R. D. Baney	Gaylord.
Ottawa	A. G. Van Hees	Zeeland	Fred Luther	Lamont.
Presque Isle*				
Roscommon*				
Saginaw	R W. Beeman	Swan Creek	J. A. Slocum	Saginaw, W.S.
Sanilac	H Schlichter	Brown City	Simon Brickner	Brown City.
Schoolcraft	D W. Thompson	Manistique	F. Greenwood	Manistique.
Shiawassee	P. B. Reynolds	Owosso	A. B. Cook	Owosso.
St. Clair	C. S. King	Pt. Huron	Jas. Dunn	Emmett.
St. Joseph	Geo Engles	Centerville	W. H. Garman	Parkville.
Tuscola	John Marshall	Cass City	J. W. Murphy	Cass City.
Van Buren	E. C. Haven	Bloomingdale	Stephen Doyle	Hartford.
Washtenaw	Wm. Campbell	Ypsilanti	F. E. Mills	Ann Arbor.
Wayne	Jas. R. Clark	Bellville	P. B. Whitbeck	Plymouth.
Wexford	R. C. Norris	Cadillac	Elwood Peck	Cadillac.

* No Institute society.
† County agricultural society.

Chairmen Women's Sections for 1900.

County.	Name.	Address.
Alcona	Mrs. D. E. Storms	Harrisville.
Alger		
Allegan		
Alpena		
Antrim		
Arenac		
Baraga		
Barry		
Bay	Mrs. Dunham	Bay City.
Benzie	Mrs. Gertrude Northrup	Thompsonville.
Berrien		
Branch	Mrs. Hiram Horton	Coldwater.
Calhoun		
Cass		
Charlevoix	Mrs. Mary E. Price	Boyne City.
Cheboygan		
Chippewa	Mrs. Dora Brown	Sault Ste. Marie.
Clare		
Clinton	Mrs. Wm. Ennest	St. Johns.
Crawford	Mrs. Jeannette Woodworth	Grayling.
Delta		
Dickinson		
Eaton	Mrs. L. M. Gage	Olivet.
Emmet	Mrs. R. C. Light	Petoskey.
Genesee		
Gladwin	Dr. Mary Graves Locke	Gladwin.
Gogebic		
Grand Traverse	Mrs. E. S. Gray	Archie.
Gratiot		
Hillsdale	Mrs. H. A. Hunker	Hillsdale.
Houghton		
Huron	Mrs. John Ryan	Bad Axe.
Ingham	Mrs. S. E. Van Meter	Williamston.
Ionia		
Iosco	Mrs. Thomas Galbraith	Tawas City.
Iron		
Isabella	Mrs. Cora J. Rowlader	Crawford.
Jackson	Mrs. D. W Chappell	Concord.
Kalamazoo		
Kalkaska	Mrs. Wm. Hayward	So. Boardman.
Kent	Martha P. Berry	Rockford.
Keweenaw		
Lake	Mrs. Fradenburg	Reed City.
Lapeer	Mrs. F. E. Odell	Lapeer.
Leelanau		
Lenawee	Dr. Julia P. Green	Adrian.
Livingston	Mrs. S. Tooley	Howell.
Luce		
Mackinac		
Macomb	Mrs. C. L. Stoddard	Lenox.

CHAIRMEN WOMEN'S SECTIONS FOR 1900.—CONCLUDED.

County.	Name.	Address.
Manistee	Mary A. Babcock	Yates.
Marquette		
Mason	Mrs. Grace T. Smith	Ludington.
Mecosta	Ida Kiefer	Borland.
Menominee	Alice M. Bowers	Stephenson.
Midland		
Missaukee	Mrs. John Cavanaugh	Falmouth.
Monroe		
Montcalm		
Montmorency		
Muskegon	Mrs. J. H. Whitney	Muskegon Heights.
Newaygo	Mrs. James Caldwell	Hesperia.
Oakland		
Oceana	Mrs. C. F. Hale	Shelby.
Ogemaw	Mrs. Cora Tolman	West Branch.
Ontonagon		
Osceola	Mrs. Eva Dillon	Tustin.
Oscoda	Mrs. E. L. Crawford	Red Oak.
Otsego	Mrs. Martindale	Gaylord.
Ottawa		
Presque Isle		
Roscommon		
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